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THE DIPHTHERIA ANTITOXIN QUESTION--DISCUSSION BEFORE THE NEW YORK ACADEMY OF MEDICINE.

ORIGINAL ARTICLES.

CLINICAL OBSERVATIONS UPON THE USE OF ANTITOXIN IN DIPHTHERIA; AND A RE- PORT OF A PERSONAL INVESTIGA- TION OF THIS TREATMENT IN THE PRINCIPAL FEVER HOSPITALS OF EUROPE DURING THE SUM- MER OF 1895.¹

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SINCE Behring's treatment for diphtheria was proclaimed to the medical profession by Roux at the Budapest Congress in 1894, sufficient time has elapsed to warrant our taking a careful analytical review as to what has transpired with reference to it. Behring's antitoxin was given to the world as a specific against the toxins of the diphtheria bacillus. It has no action on the bacillus; this is not destroyed by the antitoxin; it is not rendered less virulent; it is no way influenced by the treatment. Behring has told us that his remedy has no influence on the poisons of other bacilli. Diphtheria in man scarcely ever occurs from a pure infection by the Loeffler bacillus. Almost invariably we find in addition to the specific diphtheria bacillus, streptococci, staphylococci, etc. The poisonous substances of the latter bacilli are in no way influenced by antitoxin. This fact limits very much the application of Behring's treatment to diphtheria in man. The toxin of Loeffler's microbe causes the cardiac paralysis, the albuminuria, and the paralytic phenomena. These were to be prevented by the neutralizing effect of antitoxin. If antitoxin is an antidote to the toxin of the Loeffler microbe, cardiac depression, death from cardiac paralysis, albuminuria and post-diphtheritic paralysis should all be prevented by the action of this agent. It was to remedy these manifestations of the disease that Behring gave to the world his antitoxin. Behring told us

his treatment to be effective must be applied early in the disease. To get the maximum effect toxin and antitoxin must be applied at the same moment and at the same spot.

Armand Ruffer states that if you inject toxin on one side of the body, and antitoxin on the other side at the same time fourteen times as much is required to protect the animal; if there is a delay of one hour, one hundred times as much is required to protect the animal, and if there is a delay of eleven hours, five thousand times as much is required to protect the animal. In diphtheria in man we can never apply the antitoxin at the site of infection, nor at the moment of infection. A period necessarily intervenes from the time of infection until there are sufficient symptoms to call attention to the illness; and as the result of this there is a great limitation to the application of Behring's remedy to diphtheria in man. Another consideration of prime importance is, if we are to attribute the reported decrease of mortality of diphtheria to the action of a specific, this decrease must be uniform and constant. There must be the same reduction in mortality in all parts of the world where the remedy is applied. For instance, a mortality of eight per cent. in Paris and twenty-eight per cent. in London does not mean that the low mortality in the former city is due to the treatment, but that it is due to a difference in the character of the epidemic, and that when Paris is visited by an epidemic of the same severity as the one that exists in London it will have the same mortality in spite of the treatment. Again, if there is at work but a single factor, viz., antitoxin, in the reduction of mortality, that reduction must be below the lowest mortality recorded in the natural history of the disease in any part of the world, and it must be steadily maintained below this rate in all parts of the world; otherwise, the variations in mortality may be said to be due to the epidemic character of the disease.

We find recorded the following divergencies in the deaths from diphtheria, owing to the differences in the type of the disease:

¹ Read before the New York Academy of Medicine, May 21, 1896. Abstract made by the author especially for the MEDICAL NEWS.

In New York in 1884.....	1090
" " " 1887.....	2167
In Boston in 1891.....	232
" " " 1894.....	817
In Philada. in 1888.....	350
" " " 1889.....	375
" " " 1892.....	1425

The rule of uniformity of results applies to reports by individual observers. If one hundred physicians report five thousand cases of diphtheria, treated with antitoxin, with a mortality of five per cent, and ten physicians report five hundred cases, treated with antitoxin, with a mortality of fifty per cent., the only logical conclusion is that there was a difference in the character of the cases in the two series, and that when the one hundred physicians meet, with a series of cases of the same type, as those treated by the ten physicians, they, too, will have a mortality of fifty per cent.

The most misleading part of the antitoxin literature is the constantly quoted percentage of mortality. For instance, the mortality from diphtheria in the City of Boston in 1895 was 14.48 per cent.; in 1893, 32.49 per cent.; and yet there were 112 more deaths from diphtheria in the City of Boston in 1895 than there were in 1893. The percentage mortality from diphtheria in the Boston City Hospital in 1893 was 48.44 per cent., and in 1895, 13.21 per cent.—and yet we find that there were 203 deaths from diphtheria in the Boston City Hospital in 1893 and 207 deaths in 1895.

BOSTON CITY HOSPITAL.

Year.	Cases.	Deaths.	Per cent.
1893	419	203	48.44
1894	598	266	44.48
1895 (antitoxin)	1566	207	13.21

From the foregoing it is readily seen that the percentage mortality is not only misleading, but is absolutely worthless unless accompanied by the actual number of cases reported and the actual number of deaths; and the report must also include a series of years in order to enable the reader to compare present results with the results in previous years when there was a mild type of the disease. Reports on the antitoxin treatment having ingeniously compared the years of highest mortality instead of including all years.

At the beginning of the antitoxin treatment Behring told us that all cases treated on the first day of the disease could be saved; of those coming under treatment on the second day, nearly all, and of those brought under treatment on the third

day, the larger part of them. Behring's words were, "We have it in our hands to reduce the mortality from diphtheria to one-tenth of its former rate. Let us see how this promise of Behring's has been verified.

At the Willard Parker Hospital during the first nine months of 1895, the results were as follows:

	Cases.	Mortality. Per cent.
First day.....	108	10.09
Second day.....	130	25.19
Third day.....	116	34.18

A few cases may be cited showing actual results when treatment is begun in the earlier part of the disease:

CASE I.—Six years old, admitted to scarlet fever ward February 1, 1896; recovered from scarlet fever and was ready for discharge. March 19th, at 11.30 A.M. she complained of sore throat. The diagnosis of diphtheria having been made by bacteriological examination, she was injected with two thousand units of antitoxin—just forty hours after the disease began. In spite of antitoxin, croupy symptoms, which manifested themselves early, increased, and intubation was done at 10 A.M., 46½ hours after the beginning of her illness. On the evening of the same day intubation not affording sufficient relief from the stenosis, tracheotomy was performed. Child died at 9.45 P.M.

In this case we have an instance of a child developing diphtheria in the hospital, being put upon serum treatment as soon as the diagnosis was confirmed. Notwithstanding this, the local process extended, even intubation not affording sufficient relief.

CASE II.—Aged two and one-half years, admitted April 22d, ill one-half day. Throat clear, tonsils red and somewhat swollen, croup, some retraction, no cyanosis. Under the head of clinical notes we find, "Child rather croupy on admission." Antitoxin 2000 units on admission. Patient admitted 22d April about midday. April 23d, 8.55 A.M., intubation became necessary; 2000 more antitoxin units; temperature on admission, 100.8; April 23d, temperature 103.2; April 27th, temperature 99; April 28th, temperature 105; April 30th, temperature 101.6; afternoon of same day, 105.2. May 10th, baby died at 2.25 A.M.

This is an extraordinary record. Child had been ill one-half day on admission. Clinical notes state "Child rather croupy on admission." About the only evidence of disease then was, as stated above—in spite of antitoxin 2000 units, croup increased during the night; intubation became necessary the following day, about twenty-one hours after admission. Next, observe the

common temperature range which occurs when the patient shows unusual susceptibility to antitoxin.

CASE III.—Aged two years, admitted October 22d, one day sick. Marked injection and swelling, dirty white membrane on left tonsil, croup. Prognosis doubtful. Antitoxin 2000 units on admission. Admitted 9.30 A.M., intubated 4.15 P.M. October 23d, antitoxin 2000 units; 9.45 A.M., tube coughed up; 10.05 A.M., intubated, temperature 2 P.M. 104.6, hypodermic of brandy and nitro-glycerin, hot bath, etc.; October 24th, antitoxin 1200 units, 11.45 A.M., temperature 104, sponging, etc.; October 27th, temperature 105, sponge baths nearly every hour; October 28th, rash; October 29th, tube removed; November 1st, temperature went to 105, sponging almost hourly; November 3d, temperature 105.8, sponge baths nearly every hour; November 5th, 102 to 105; November 6th, temperature 105.8, sponge baths constantly kept up; November 7th, temperature 101.2 to 106.2, sponge baths almost constantly; November 8th, temperature 102 to 106; November 9th, patient died at 6.40 P.M.

Here we have a baby two years old, sick one day when admitted to the Hospital, October 22d, 9.30 A.M., given antitoxin immediately (in all 5200 units), and the result is shown by the clinical history. If antitoxin has any possible effect in neutralizing the poison of diphtheria, in relieving or preventing stenosis, or in any way allaying laryngeal symptoms, only a very small part of the clinical history here recorded would have manifested itself. There are several histories which show undoubted instances of the bad effects of antitoxin on nervous centers.

CASE IV.—Child aged fourteen months, admitted November 6th, illness began November 3d. Small patch of membrane on right tonsil, K.-L.B., no complication. Antitoxin 1000 units on admission. November 9th, slept at intervals quietly, but was very restless when awake; November 10th, extremely restless most of the night, temperature 104, sponge bath; November 12th, pulse very weak; November 20th, rash appeared; November 6th, antitoxin 2000 units, 5.30 A.M., intubated at 1 P.M., very restless during the day, 8.15 P.M. temperature 106. Child failed to respond to stimulants. Temperature became more and more elevated, in spite of sponge bath. December 7th, died at 12.30 A.M.

According to the record, this child had almost no illness on admission. It became very restless after the first injection of 1000 units of antitoxin. Restlessness reappeared in exaggerated form after injection of antitoxin of 2000 units, along with high temperature and rapid respiration, until death.

CASE V.—Child, aged seven months, admitted February 4th, three days sick. Nothing in throat. Slight laryngeal symptoms. Clinical note states: "Slight croup, otherwise good condition." February 5th, antitoxin 2000 units; February 6th, antitoxin 2000 units; 4 A.M. temperature 104.2; February 11th, temperature suddenly rose and erythema appeared in patches over the body; temperature in the evening reached 105.4. February 12th, rash more marked since midnight; marked opisthotonos and stiff neck. February 12th, temperature 106 all night. February 14th, glands and right side of neck swollen, temperature 104 to 106, until March 18th, patient had convulsions during the night. March 19th, child died 9 P.M.

CASE VI.—Child aged one year, admitted October 13th, three days sick, marked swelling and injection, no membrane, croup; intubated on admission. October 13th, antitoxin 2000 units. October 14th, antitoxin 2000 units. October 14th, tube coughed up at 4.10 A.M.; had to be reintubated at 8.30 A.M. October 15th, tube coughed up at 10.30 A.M.; reintubated 12.30 P.M. October 16th, tube coughed up at 7.10 A.M. October 19th, temperature suddenly rose to 104; temperature remained high, but somewhat fluctuating, until 21st, when it reached 105.4, and the baby had slight convulsions. In the afternoon, respiration became very superficial; patient failed to respond to stimulants. October 21st, died at 5.25 P.M.

CASE VII.—Child, aged fourteen months, admitted February 20th, five days sick. Rather thick patch on right tonsil, cry and breathing croupy, no retraction. "Patient admitted in croupy condition; not bad enough to require intubation: prognosis good." Antitoxin 2000 units. February 21st, antitoxin 2000 units at 10.15 A.M. Intubated at 2.10 P.M. 5.45 P.M., tube removed. February 23d, 8.30 A.M., temperature 104.5° F.; 12 M. 105° F.; pulse, 184; respiration, 84. 11 P.M., temperature, 106.2° F.; opisthotonos; plunge bath for ten minutes. February 23d, temperature down, but still opisthotonos and great prostration. February 29th, opisthotonos; eyes rolled up, with lids half closed when asleep. March 3d, opisthotonos and rolled up eyes. March 6th, died at 8.15 P.M.

CASE VIII.—Child, aged three years, admitted February 17th. Four days sick. Much membrane on either tonsil, and in pillars of fauces. Nose plugged; prognosis doubtful. Antitoxin 2000 units on admission. February 18th, antitoxin 2000 units. February 19th, antitoxin 2000 units. February 21st, patient seems better today. This evening he gave a peculiar cry, heard by the nurse, and was dead on the arrival of the physician a moment later. There were no heart-sounds, but artificial respiration was kept up for ten minutes, and stimulants were also given. Patient gasped several times and died.

CASE IX.—Patient, aged sixteen years, admitted May 20th; illness began May 18th; well-devel-

oped and nourished. Glands of the neck enormously swollen; throat much congested; swelling and implication of left tonsil, right tonsil, and right peritonsillar space, and whole area back into pharynx covered with a dirty white deposit. Nares partially obstructed; prognosis favorable. Antitoxin 10 cc. $\frac{1}{1000}$ injected on admission. May 31st, 9 cc. $\frac{1}{1000}$. May 25th, 7 cc. $\frac{1}{1000}$. May 26th, pulse 26 to 30 per minute. Patient died at 10.30 P.M.

This was a remarkably large, strong, well-developed young lady, who was brought to the Hospital as soon as the diagnosis of diphtheria was made. If antitoxin has any specific influence over the toxin of diphtheria this patient should have been saved. As the report of the hospital shows she died from the effects of the toxins on the heart and nervous centers. The pulse having ranged during the last twenty-four hours of life from 26 to 30 per minute, even with the foot of the bed elevated, and with the use of all possible stimulants.

These histories are of cases brought under treatment in the early part of the disease—many of them on the first and second day. They had full doses of a supposed specific, and we do not find recorded in the clinical history one statement which would indicate that this specific modified in any particular a single manifestation of the disease, either in the laryngeal or non-laryngeal cases. Not one item in the clinical records can be found to indicate that any one of these cases was in any way benefited by the antitoxin. This is particularly noticeable in the laryngeal cases. Patients brought in without evidence of very marked croup, and after receiving full doses of antitoxin, had to be intubated twelve and twenty-four hours after hypodermic use of this so-called specific. The clinical records of these cases are totally against the use of antitoxin in the treatment of diphtheria. A careful study of these records will, it seems to me, convince one who is familiar with diphtheria that there are clinical features here recorded which are due to the treatment and not to the disease. These features are referable to the kidneys, nervous centers, temperature, and respiratory organs. There are forty-one similar cases reported. The numerous cases quoted from journal literature, showing the injurious effects of antitoxin, are many of them exact counterparts in their clinical course of the Willard Parker Hospital cases here reported, and taken together, are confirmatory of the view that antitoxin may prove an immediate fatal poison, even when given in immunizing doses—that it may cause nervous phenomena, convul-

sions, etc., that it may cause anuria, nephritis, albuminuria, hematuria, cardiac collapse, high and uncontrollable temperature, probably due to septic processes, septic pneumonia, subcutaneous hemorrhages, petechiæ, arthralgia, joint effusions, intestinal hemorrhages, fetid diarrhea, etc.

In New York and elsewhere it has been claimed in defense of the serum that the unfortunate ill-effects, in the form of high fever and suppurations, are due to streptococcus infection; but if this were really the case they should supervene while the morbid affection is in process of evolution in the throat; whereas, they usually supervene after the disappearance of all throat lesions. It is now stated that the bad effects, which formerly resulted from the use of antitoxin, were due to the amount of serum injected, and that with the use of a more concentrated serum there would be less pneumonia and bad after effects than formerly. This is a very weak admission. It is an admission that there are bad effects from the serum. One year ago it was asserted most positively by the advocates of this treatment that there was no bad effects—that it was absolutely harmless in doses of any amount.

ANTITOXIN IN PRIVATE PRACTICE.

Dr. Edwin B. Tefft (New Rochelle) reports five cases of diphtheria, treated with antitoxin, three deaths, mortality sixty per cent. During the same period there were five cases stated by Dr. Tefft to be equally severe, treated without antitoxin, all recovered. Cases treated with antitoxin had the same internal and local treatment as those treated without antitoxin. These antitoxin cases had a so-called specific at the very beginning of the disease, and in addition such tonic, stimulating and local antiseptic treatment as one of our best physicians could devise, and yet they show a mortality of sixty per cent., as contrasted with no deaths in five other cases treated without antitoxin.

Dr. de Kraft had three cases of diphtheria in one family, two treated with antitoxin at the beginning of the disease and both died; one without antitoxin got well. Another patient in Dr. de Kraft's practice died one hour after the injection of antitoxin.

Dr. J. C. Shannon recently treated two patients in one family with antitoxin at the very outset of the disease, and both died.

Dr. Koempel reports case of a child taken ill on the night of April 22d. Antitoxin during the first twelve hours; second dose the following day. Child died twenty-four hours later.

Dr. J. H. Bache reports three patients treated at the beginning of the disease, two of whom died. A third case, the child of a physician, barely escaped death from the after-effects of antitoxin.

Dr. P. H. Ernst reports twelve patients treated with antitoxin, 7 deaths, mortality 58.3 per cent.; 65 patients treated without antitoxin, 11 deaths, mortality 16.9 per cent.

Dr. John Dorning employed antitoxin in his private practice in seven consecutive cases of diphtheria, in the early part of the disease, in some of the patients during the first twelve and eighteen hours, and all the patients died.

MORTALITY IN THE WILLARD PARKER HOSPITAL.

Year.	Cases.	Deaths.	Per cent.
1894 (non-antitoxin)	699	205	29.32
1895 (antitoxin)	778	190	24.42

Could those cases be eliminated which gave no clinical evidence of diphtheria, the mortality of twenty-four per cent. for 1895 would be greatly increased.

Dr. Ewing made an investigation in the Willard Parker Hospital, with reference to influence of antitoxin on the blood. His investigations included 53 patients with diphtheria, 50 of these were injected with antitoxin, 19 died, mortality H. 38 per cent. Dr. Ewing's investigations in the Hospital was in cases in which there was clinical evidence of diphtheria; and my impression is that this report (38 per cent. mortality) would fairly well represent the actual mortality of the Willard Parker Hospital at the present time under serum-therapy, if patients who have clinical evidence of diphtheria were subjected to this treatment to the exclusion and elimination of those cases which have no clinical data to warrant the diagnosis of diphtheria. In order to determine the result with reference to larger or smaller doses of serum, it was decided in the autumn of 1895, to give to alternate cases as admitted into the hospital, doses of serum of 1000, 2000, and 3000 units, respectively. There were two series of cases, known as mild and severe, having 2000 and 3000 units respectively. In the two series of cases marked "severe," having 2000 and 3000 units respectively, at a dose, there were 23 patients in the series having 2000 units, of whom 7 died, mortality 30.4 per cent.; and there were 22 cases in the series marked "severe" having 3000 units; of these, 11 died, mortality 50 per cent. In the 2 series marked severe, the cases were probably of nearly equal severity, inasmuch as they were alternate cases as received into the Hospital, the mortality being higher with the larger doses of

serum, in a series of parallel cases. Since these experiments, no child has received doses of 3000 units. In this series of experimental dosage, there were 94 cases, 24 deaths, mortality 25.5 per cent. Children under two years in 1894, 163 cases, 84 deaths, mortality 51.5 per cent.; in 1895 (antitoxin year), 153 cases, 95 deaths, mortality 62.1 per cent.

At the very time of life when diphtheria is most dangerous, we have in the Willard Parker Hospital a mortality of 10.6 per cent. greater with antitoxin treatment than without.

ANTITOXIN IN NEW YORK FOUNDLING ASYLUM.

Professor J. Lewis Smith has reported 31 diphtheria patients treated with antitoxin in the New York Foundling Asylum, 12 on the first day, 17 on the second or third days, 2 on the fourth or fifth days; 17 died, mortality 54.8 per cent. Mortality in New York Foundling Hospital in 1894 (non-antitoxin year), 24 per cent.; 1895 (antitoxin year), 45.7 per cent.

MUNICIPAL HOSPITAL, PHILADELPHIA.

During the year 1895, there were 706 cases of diphtheria treated in the Municipal Hospital, Philadelphia; 302 of these received serum; 404 treated without serum. No patient was injected who had been ill more than four days at the time of admission to the hospital. Cases that were considered hopeless on admission did not receive serum treatment; all patients that were considered hopeless and brought to the hospital were placed with the non-serum treated cases, and some of these died within an hour after admission. The mortality in the 302 cases treated with serum was 28.1 per cent. The mortality in the 404 cases treated without antitoxin was 25.9 per cent. The cases treated with serum had the same local antiseptic treatment and the same internal medication and stimulation that were given to the series of non-serum treated, and yet with a so-called specific added to the treatment in a far more favorable series of cases, there is a higher death-rate than in those not treated with serum.

RESULTS IN BLEGDAM HOSPITAL, COPENHAGEN.

Fifty-one cases of severe diphtheria, treated with serum, 46 cases of severe diphtheria treated without serum, during the same period, mortality 33 per cent. in both series. The average age of those treated without serum was lower than those treated with serum. Among those who died, those who were treated with serum, were admitted

earlier to the Hospital than those who were not so treated. At the time of admission to Hospital, complications were more pronounced in the cases treated without serum, the air-passages being affected in 8 cases, while with those treated with serum, only 3 were affected. Severe complications of the kidneys (after admission to the Hospital) were observed only in those treated with serum. The serum was used earlier in the fatal cases than in the cases which recovered. That is, the day of the first injection was, on an average, earlier in the fatal cases than in the successful cases. From our experiments we cannot see any favorable action of the serum. On the other hand, we observe more severe hemorrhages, albuminuria, nephritis, toxic-anuria, fever, eruptions, etc., in those treated with serum. The serum was also used in croup cases complicated by severe diphtheria, and in mild cases of croup for the purpose of preventing stenosis. The mortality in all cases (operated and not operated) was 28 per cent., and for operated cases 40 per cent.; but during this same period there were 87 cases of croup that were not injected; the mortality in these for all cases (operated and not operated) was 25 per cent., and for operated cases 38 per cent.; therefore, lower than in those treated with serum. Severe diphtheria complicated with croup did very badly with this treatment. All such patients died, and the good result in milder cases is explained by the good type of the present epidemic.

REPORT OF THE MEDICAL SUPERINTENDENTS OF
THE METROPOLITAN ASYLUMS BOARD HOSPITALS
(LONDON), 1895.

This report embraces 2182 cases of diphtheria treated with antitoxin, 615 deaths, mortality 28.1 per cent. The medical superintendents compare this report with that of 1894, when 3042 cases of diphtheria were treated in all the hospitals of the board without antitoxin, 902 deaths, mortality 29.6 per cent.; but we find that in the Northwestern and Southwestern Fever Hospitals of London, the following results to compare with the antitoxin statistics:

SOUTHWESTERN HOSPITAL.

Year.	Cases.	Deaths.	Per cent.
1892	463	93	22.5
1893	585	159	27.1
1894	546	156	28.5
	1594	408	25.5
1895 (antitoxin)	316	94	29.7

NORTHWESTERN HOSPITAL.

Year.	Cases.	Deaths.	Per cent.
1892	682	138	21.8
1893	1249	332	26.5
1894	1147	309	26.9
	3078	779	25.3
1895 (antitoxin)	363	117	32.2

IN THE SOUTHWESTERN AND NORTHWESTERN
HOSPITALS, 1892, '93, '94.

Cases.	Deaths.	Per cent.
4672	1187	25.4

IN ALL THE HOSPITALS, 1895 (ANTITOXIN).

Cases.	Deaths.	Per cent.
2182	515	28.1

There were 225 tracheotomy cases in all the hospitals of the Metropolitan Asylums Board, in 1895, treated with antitoxin; 113 deaths, mortality 50.2 per cent. During the year there were 30 tracheotomy cases in these same hospitals that did not receive antitoxin; 12 deaths, mortality 40 per cent.—10.2 per cent. lower without antitoxin than in those treated with antitoxin. This is just the result to be expected when a depressant like antitoxin is added to the treatment of cases of diphtheria so serious as to require tracheotomy. It cannot be said that the tracheotomy cases, which were not treated with antitoxin were mild cases. The tracheotomy cases treated with and without antitoxin during the year 1895 were cases of the same degree, and offered a very good field for comparison of results.

At the Northwestern Hospital, during 1892, '93, '94, there were 215 tracheotomy cases, 124 deaths mortality 57.6 per cent. During 1895 there were 28 tracheotomy cases in this Hospital treated with antitoxin; 18 deaths, mortality 64.2 per cent. During the year 1895 there were 4 tracheotomy cases in the Northwestern Hospital treated without antitoxin; all recovered. Nothing could be more conclusive of the depressing and dangerous effect of the antitoxin in that severe form of diphtheria of the larynx and trachea, which necessitates tracheotomy, than the records of the Northwestern Fever Hospital for the years 1892-'95.

ANTITOXIN IN LARYNGEAL DIPHTHERIA.

About the only claim made for antitoxin at the present time by its advocates is that it has a favorable influence in laryngeal diphtheria; that it relieves stenosis; that it obviates the necessity for operative interference; that the mortality is lower in non-operated cases and operated cases treated with serum; that the tube can be removed

earlier when operation becomes necessary. If antitoxin does not cause a "melting away" of the membrane, as it was first claimed, and does not lessen the duration of the membrane in the visible portions of the throat, what reason have we for supposing that it influences the duration of the membranes in the larynx? The mortality in the Willard Parker Hospital for the first nine months of 1895, in intubation cases treated with antitoxin was 68 per cent., and for the last quarter, 76.9 per cent. During the first quarter of 1896, 67.7 per cent. In April, 72.7 per cent. In the Municipal Hospital, Philadelphia, there were in 71 intubation cases, treated without serum in 1895, 40 deaths, mortality 56.3 per cent. Widerhofer gives mortality of 43 per cent. in intubation cases before serum treatment.

Von Ranke in 326 intubation cases, mortality 57.4 per cent., before serum treatment. Meisenbach, 57 per cent. in tracheotomy cases in the Philadelphia Children's Hospital, before serum treatment. In Strassburg, in 397 tracheotomy cases (1891-94), mortality was 44.3 per cent. In Geneva (1872-88), mortality in tracheotomy cases, 49 per cent.

In the University College Hospital (London), mortality in tracheotomy cases in 1894 (non-antitoxin year) was 47 per cent.

Is not the very high mortality in intubation cases treated with antitoxin in the Willard Parker Hospital, when compared with the results in intubation cases without antitoxin in the Municipal Hospital, Philadelphia, and the intubation cases reported by Widerhofer and Von Ranke before serum treatment, and in tracheotomy cases in Philadelphia, and in all parts of the world, before serum treatment, a most positive warning against the use of this treatment in this serious and dangerous form of diphtheria?

Why is it that antitoxin has to-day the hold on the profession which it has? The fame of antitoxin is largely due to the influence of two hospitals—the Empress Frederick Hospital (Berlin) and the Hospital for Sick Children, in Paris. We find that the Empress Frederick Hospital received 875 cases of diphtheria during 14½ months of serum treatment, and that there had been received into the same Hospital during the previous four years only 1063 cases of diphtheria. It is owing to this increase in the number of cases of diphtheria in the various hospitals, and the increase in the number of cases reported as diphtheria, as the result of the bacteriological diagnosis in various cities of the world, that antitoxin is reputed for reducing the death-rate of diph-

theria. A careful examination of the subject reveals the fact that the actual number of deaths have not been lessened, but, as stated at the outset of this article, the fame of antitoxin rests on the reported decreased percentage mortality. We find, on examination of the reports from various cities and hospitals, just what was pointed out, with reference to the City of Boston as a whole, and of the Boston City Hospital, that the actual number of deaths have not been lessened.

A CRITICAL ANALYSIS OF DR. WINTERS' CLINICAL OBSERVATIONS ON THE ANTITOXIN TREATMENT OF DIPHTHERIA.¹

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WHEN asked, some weeks ago, to take part in the discussion of the antitoxin treatment of diphtheria, it was only after considerable hesitation that I decided to accept the invitation. There were several reasons for my hesitation. In the first place, my experience with antitoxin, like that of Dr. Winters, is practically confined to hospital practice, and I believe that the time has passed when hospital experience can contribute much of value to the subject under discussion this evening. One year ago the case was different. At that time we had to rely entirely upon the experience of hospital physicians, who alone had a large number of cases at their disposal. Antitoxin must be administered early in order to get the best results, and we all know that cases do not, as a rule, reach the hospital until several days have elapsed from the beginning of the disease. It is in private practice only that the disease can be recognized and treated early, so that antitoxin may exert its greatest effect. Fortunately we have now the experience of a large number of private practitioners, and it is they alone who can speak with authority on the subject. There are many in this room who have treated from twenty to a hundred cases, and I do not think that either Dr. Winters or myself is competent to express an opinion in their presence on the real value of antitoxin.

Secondly, I can hardly criticize Dr. Winters' views of antitoxin without commenting upon the attitude he has publicly assumed toward the Willard Parker Hospital. If Dr. Winters' position is sound and his observations are correct, the City of New York has been maintaining for

¹ Read in the Discussion on the Antitoxin Treatment of Diphtheria before the New York Academy of Medicine. Abstract made by the author especially for the MEDICAL NEWS.

eighteen months a hospital to which children have been taken and subjected to a method of treatment which is not only useless, but has in many instances led to the death of those children. This has been distinctly stated by Dr. Winters, and cases described by him in detail. As these statements have been made more than once in this Academy, it is here that they should be disproved, if possible.

A few words as to what led to the use of antitoxin in Willard Parker Hospital, and who is responsible for its administration. In the autumn of 1894 the Board of Health, in view of the claims made for it abroad, decided to give it a fair trial in the hospitals under their charge as soon as a sufficient supply of the serum could be obtained. The hospitals of the Health Department differ from the rest of the hospitals of the city, in that they have a resident physician who is directly responsible to the Board of Health, and only indirectly to the Board of Visiting Physicians attached to the hospital. The position of the Board of Visiting Physicians has been rather that of advisers and consultants. We, as a body, were entirely in favor of the step taken by the Board of Health. I state these facts to make it plain that all of the visiting physicians at Willard Parker Hospital stand on the same level with reference to the use of antitoxin at that Hospital. No one of us has any especial interest in its use other than to determine its real value in the treatment of diphtheria. In considering the position which Dr. Winters assumed in his paper, read at the last meeting of the Academy, I wish it understood I am attacking his position, not himself. We believe that he has made a grave mistake, and has done great wrong to the Hospital of which he is one of the physicians, and that his words have caused widespread harm among the people of New York and of the whole country.

Before taking up the evidence submitted by Dr. Winters in support of his views let us see whether he entered upon his observations in the Hospital with a mind open to conviction and free from bias. One cannot read the arguments of any of the opponents of antitoxin without being struck with the fact that they all start with a distrust of the bacteriological diagnosis of diphtheria, and with a reluctance to accept the help offered by the bacteriologists to the clinicians. Dr. Winters is no exception to this rule, and as long ago as December, 1894, it was evident to the other members of our Board that he had strong doubts of the curative power of antitoxin, and was prepared to find it of no value. The systematic use of an-

titoxin was begun on January 1st of the following year, and from the very beginning he had no faith in its virtues, and was daily proving to himself that he was right in his opinion. He, however, kept his counsel, and no one had any inkling of what was to take place on that memorable evening in April one year ago. After barely three months of observations on some one hundred and fifty hospital cases, Dr. Winters had decided, for all time, that antitoxin was absolutely without value, and in addition produced great harm, even to the extent of causing death in those to whom it was given. From that time to this he has become more fixed in his convictions, and has confirmed them by a personal investigation of the hospitals of Europe.

I, unfortunately, was not present at the meeting last year, but I have read and reread his vivid description of cases which had died of antitoxin poisoning in the Willard Parker Hospital. I shall now take up some of the statements made in Dr. Winters' last paper, first, those bearing on his observations in the Willard Parker Hospital, and, secondly, the ideas which he had gathered on his trip abroad.

All advocates of antitoxin state that it must be given early and in efficient doses in order to produce its full effects. Dr. Winters claims that even when given under these conditions it is not only valueless, but, as seen by its action on mild cases, it even causes the death of the patient. In proof of this he cited twenty-five or thirty cases of favorable prognosis, which had been injected on the first, second, or third day of the disease, and still died. He stated that these cases were taken from the early months of 1895 and 1896—twenty-five or thirty cases. He did not give the full details of the cases; time did not permit of his giving more than what he called the "gist" of the cases. I have collected the records of all fatal cases injected on the first, second, and third day, during the first four months of 1895 and the same period for 1896. There were nineteen in 1895. Twelve were two years of age or less; two were between two and three, leaving only five cases above the age of three years. One was four, two five, one seven, one forty-five. What was the condition of these fatal cases? Twelve had laryngeal stenosis, requiring intubation. Seven of the twelve cases in addition had pneumonia. Five of the non-laryngeal cases also had pneumonia, making twelve cases of pneumonia, and seventeen of the nineteen with either pneumonia or laryngeal stenosis, or both. The single adult case of the group, when he entered the hospital, showed im-

pending delirium tremens. In spite of that the prognosis was put down as favorable.

Now, what was the prognosis stated in those cases? It was stated in the records, instead of being favorable in all, that the prognosis was good in six, doubtful in five, bad in eight.

Let us now take the cases for a similar period in 1896, January 1st to May 1st—some thirty-three fatal cases injected on the first, second, or third day. Seven were less than one year of age, thirteen more were less than two, four just two, five between two and three, making twenty-nine of the thirty-three fatal cases under three years of age, four cases over three years of age. Character of the cases: Twenty-two had laryngeal stenosis, requiring an operation in nineteen, fifteen cases had pneumonia, two suffered from sepsis, one, the only adult, was intoxicated on admission. The prognosis was stated on the records as good in two, doubtful in twenty, bad in eleven. The gist of the cases as given by Dr. Winters was, if I remember rightly, favorable prognosis practically in all; death after injection of antitoxin.

Dr. Winters has stated that since the introduction of antitoxin into the Hospital there had been much greater use of stimulants. Now, it had been the distinct impression of all the rest of the attending staff that less stimulants had been used during the last sixteen months, just as they had found the treatment diminished the amount of iron, etc., used. Through fear that we might have been deceived, I sent to the clerk of supplies to the Health Department, and had learned the amount of alcoholic stimulants used in the Hospital during the antitoxin period, and for a like period just before. Then considering the number of patients in the Hospital for these periods, and the average daily attendance, I found that during the period when antitoxin was in use the amount of alcohol, per patient, per day, was considerably less than one-half an ounce, while during the previous period it was two-thirds of an ounce.

Regarding diarrhea, from which Dr. Winters had said there had been trouble, none of the rest of us had seen it. If anything, there had been more trouble from constipation. The ward charts of perhaps a majority of the patients will show a record of laxatives ordered by the resident physician.

In his paper Dr. Winters has spoken of a very peculiar type of broncho-pneumonia, which he attributed to the dissolving action of the serum on the blood. He had also spoken of the great amount of suppression of the urine, requiring various measures to relieve it, and of increase in

albuminuria. Considerable stress also has been laid on cardiac weakness. We have seen no change in these respects in the Hospital. The cases had been just about as they were before, so far as the general condition was concerned, but cases had recovered in greater numbers. They had not been able to say just why, but the mortality had been less. The death-rate in 1894, previous to the use of antitoxin, had been about thirty-four per cent. In 1895, under the antitoxin treatment, about twenty-six per cent.

Dr. Winters had made a comparison at the last meeting which was a little misleading. The figures for intubation the past year, since the introduction of antitoxin, had given a mortality of seventy-two per cent., as compared with eighty-five per cent. in 1894. Dr. Winters had not been very much impressed with this apparent reduction of the mortality to seventy-two per cent., as he stated that a former resident physician at the Willard Parker Hospital had obtained a mortality of only fifty per cent in *laryngeal* cases. Note the difference: *laryngeal* cases, not cases of intubation. Dr. White had made that report, and he did not claim a mortality of only fifty per cent. in intubation cases. I do not know what is the exact mortality from laryngeal cases during the use of serum, but I believe it is between forty and forty-five per cent.

Dr. Winters has spoken of so many cases coming in since January, 1895, with nothing in the throat, but, I have found that according to the records one-third of all the cases in 1894, before the use of antitoxin, had no membrane, or but a small amount, attached to the tonsils. During the spring and the autumn of 1894 I was in the habit of taking students to the Hospital, and on asking the resident physician: "What have we to show the students to-day?" I was met over and over again with the reply that there were two or three new cases, but with nothing in the throat.

It was curious that in this new disease described by Dr. Winters, there had been no *post-mortem* findings. Many *post-mortems* had been made last year. I have attended many, and Dr. Winters also, and portions of the organs were secured by Dr. Winters for private examination. I expected to hear the results of the autopsies and histological investigation. Perhaps these were included in the portion of the paper not read. In my opinion, the lesions were such as had been seen before the use of antitoxin—broncho-pneumonia, fatty degeneration of the heart, and nephritis. A report by Kolisko of Vienna, on this subject is very instructive. Kolisko has been

professor of pathology and pathologist to the University of Vienna since 1882. He had made some thousand autopsies on diphtheria. Since the use of antitoxin he had made seventy-five autopsies, and was convinced that the serum influenced the diphtheritic process most favorably. The membrane was more easily separated, and was often loosened. The same thing had been seen before the use of antitoxin, but never to the same extent, or so soon after the onset of the disease. It was necessary, however, that a certain period of time should have elapsed after the injection, and that the dose should reach a certain amount, for if it were too small, separation of membrane would not be observed. When the process had penetrated deeply, the effect was less marked or *nil*. The anatomical changes in the internal organs were the same, broncho-pneumonia, fatty heart, changes in the kidneys.

Kolisko also stated that at times, before the use of antitoxin, all cases would show nephritis, then there would be a period when there would be none, and it was so since the use of antitoxin. He was positive that antitoxin had no effect in producing nephritis. Kolisko lays stress upon the important clinical fact that the diphtheritic process may remain localized at some hidden point, as in a crypt of the tonsil, or in the nasal cavity, and then suddenly break out with great virulence and fatal termination. Such cases illustrate how we may be deceived when we believe that we are injecting a case on the first or second day of the illness.

Dr. Winters quoted a number of the physicians attached to the hospitals of the Health Department as expressing themselves unfavorably to antitoxin. Some of the physicians had gone so far as to say, according to his quotation, that they knew cases which had died from the use of antitoxin. It would seem to prove that Dr. Winters does not realize the significance of his own utterances when he attributes such statements to men who hold official places under the Health Board. I have been told by many of these men that Dr. Winters had not altogether understood their views.

I shall now refer briefly to the evidence collected by Dr. Winters in Europe. Regarding some who were supposed to be the opponents of antitoxin, Hansemann, who was supposed to reflect the opinion of Virchow, had had nothing more to say when Virchow, on observing the results at the Berlin Children's Hospital, was so struck by those results that he was compelled to change his opinion, and became a convert. Kassowitz of Vienna, was a disbeliever after an experience with eight cases,

but he had had nothing to say since, after having been answered by Widerhoefer. Lennox Browne had once been a strong opponent of antitoxin, and is probably still skeptical. Two of the men quoted by Dr. Winters as having been opposed to antitoxin, one in Paris and the other in England, were young men, and had not had that experience with diphtheria previous to the introduction of antitoxin to enable them to appreciate the improved results under the latter. Variot, who had been represented by Dr. Winters as a firm believer in antitoxin, but was now opposed to it, had always been inclined to dwell upon the unfavorable side of antitoxin, as is shown by the simple titles of his papers.

Toward the end of his paper Dr. Winters had stated that all the earlier claims for antitoxin had been abandoned. I can hardly believe that he had really meant to go as far as that. I have looked over the literature of the last few months, and have here the strongest testimony from various parts of the world—Massachusetts, Germany, England, and Japan. These papers, from which I shall read a few extracts, all speak of favorable results from antitoxin, both in the treatment of diphtheria and when used for immunizing purposes.

In the foregoing analysis of Dr. Winters' clinical observations, I have not attempted to estimate the exact value of antitoxin in the treatment of diphtheria. I have kept steadily in view the task I set myself at the outset—the task of proving that the children in the Willard Parker Hospital have not been injuriously affected by the administration of antitoxic serum. This purpose I believe I have accomplished. Incidentally, it has also been demonstrated that the position of Dr. Winters in regard to antitoxin does not stand the test of critical examination. His descriptions of cases of antitoxin poisoning in the Willard Parker Hospital have no sound basis of fact, and they have not been confirmed by other observers, though they were published to the world more than one year ago.

DIPHTHERIA WITH AND WITHOUT ANTITOXIN.¹

BY WM. L. STOWELL,
OF NEW YORK.

THE basis of this article was a study of 240 cases that the author had treated in dispensary practice during the years 1888–1895 inclusive, *without antitoxin*. He gave results of treatment

¹ Read at the meeting of the New York Academy of Medicine, June 4, 1896. Abstract made by the author especially for the MEDICAL NEWS.

reported by other observers for the same period, and a *resume* of results with antitoxin in the same class of cases and in his hospital service.

One hundred and seventy-six of his cases occurred up to March, 1895, and were reported last year in the *Medical Record*. The mortality was thirteen per cent., without eliminating those who died within twenty-four hours. Dropping such, the rate was ten per cent. As these were in part before the days of bacterial culture, he checked his figures by counting all the tonsillitis cases for the same time. Of these there were 551. Of the tonsillitis cases, many had a quantity of exudate that was membranous, but his aim seemed to be to avoid a diagnosis of diphtheria so far as possible. During 1895, he treated sixty-four cases of diphtheria, with a mortality of 7.8 per cent. This great fall in mortality was not due to change in method, for there was none, but to the large number of mild cases. In fact, only two were severe enough to call for intubation. The number of mild cases was attributed to the care with which all the physicians now report exudates as possible diphtheria.

The total figures were 240 cases in eight years; mortality 11.25 per cent., without eliminating. This was better than the health inspectors report on similar tenement cases given antitoxin. Their figures were 255 cases, 15.69 per cent. deaths. Smith, Billington, and Stowell together had published 495 tenement cases, with a mortality of a little over 10 per cent.

The Leipzig physicians, a few years ago, collected 1141 cases, with a mortality of 15 per cent. The *British Medical Journal* had also collected 1321 cases, with 14 per cent. mortality, before antitoxin days. These reports the author considered a better standard for practitioners than hospital statistics.

It was noted as a remarkable coincidence that the number of diphtheria cases reported in this city increased markedly from the beginning of cultures by the Health Department. Previous to 1893, the reports had been 4359, 4974, and 4654 per year, but the number then rose to 6469, 9155, and 9925 for the last three years. Similar results were seen in the official reports from Berlin and Paris, and in all cities where cultures are made by the health boards.

The author laid stress on the fact that many reported cases never presented clinical symptoms. He mentioned a family in which a boy had marked diphtheria, and where four other members were declared to have the same, even after the rooms had been fumigated. These four persons showed

no evidence of disease, and did not take medicine. He instanced the case of the New York Infant Asylum, in which nearly half the inmates showed diphtheria bacilli in their throats when some children in the house were really down with diphtheria. These are the cases that swell the reports and cause a decrease in the ratio of deaths.

Klebs-Loeffler bacilli have been found on the floor of wards, on scrapings from the shoes of attendants, on the hair, etc. Roux found them in twenty-six of fifty healthy children whom he examined. Something more than the presence of germs is necessary to constitute the disease diphtheria. While the author has made a distinction in name between exudative tonsillitis and diphtheria, he has treated the former, like the latter, with iron and peroxid of hydrogen.

Returning to figures, the unfairness is shown of comparing 1895 with 1894 as to results, and claiming that antitoxin is the cause. In 1894, 2359 persons died in this city from diphtheria. This is the *greatest* fatal number on the city records. It is twenty years since 2300 such deaths occurred, and 2100 has been reached but twice in that time; 1634 died of diphtheria in 1895. This is just the average for a decade previous to 1894, but of course must be increased slightly for increasing population. A mild year is therefore shown to be compared with the worst possible. A fall of 600 or 800 has occurred many times in the mortality returns, when no change of treatment could be thought to influence it.

The official reports of the Health Department regarding Willard Parker Hospital were then quoted. As there given, the mortality has averaged twenty-four per cent. since 1886. Great gains are claimed for antitoxin, while the fact is forgotten that three times since 1886 the mortality was less than in 1895.

The London Asylums Board hospitals reported a mortality of 30 per cent. in 11,000 cases treated during six years ending with 1894. In 1895, the same hospitals treated 2182 cases by antitoxin, with a mortality of 28 per cent. They add to this number 1347 cases treated without antitoxin (claimed to be mild, etc.), and report a death-rate of 22.5 per cent. In order to give the low rate for antitoxin, they report a series of cases of which more than one-third had no antitoxin.

The report of Boston City Hospital for December, 1894, and January, 1895, was cited. There, 80 cases with antitoxin gave a mortality of 16 per cent. At the same time, 40 cases had no antitoxin, and 30 per cent. of them died. The reason given is "that 5 patients were moribund on entering, that

6 were too far advanced in the disease, and because, owing to the insufficient supply of serum, it was thought best to withhold it for cases giving promise of better results."

The refusal of a health inspector to inject cases on Randall's Island, "because it would increase the percentage of deaths," was cited. The doctor did not blame either of these men, but cited the cases to exemplify the fact that no cases are too bad for comparison with antitoxin, but that it is given in early and favorable cases. The advantages of early treatment have been insisted upon by all writers and advocates of all treatment.

Examples of success without antitoxin were then given.

Hübner reports 117 cases with antitoxin, mortality 10.2 per cent; 46 complicated cases, with mortality of 21 per cent. Yet in 1889 he reported that by carbolic acid injections into the tonsil he had reduced the mortality of scarlatinal diphtheria from 35 per cent. to 10 per cent.

Hennig, in a collective report, gives 1054 cases by same treatment, mortality 2.7 per cent.

Seibert's mortality with chlorin injections was 5.7 per cent.

In the New York Foundling Asylum, the mortality was 52 per cent. in 1891, and 38 per cent. in 1892. This fell to 27 and 24 per cent. for the next two years under papyotin and hydrogen peroxid, but rose again to 45 per cent. when treatment was changed to antitoxin.

Loeffler uses alcohol, tolnoil, and tr. ferri chloridi locally, and reports 71 cases in private practice with no death; also 30 cases in hospital with 16 per cent. mortality.

Jacobi reports 40 consecutive cases with 2.5 per cent. of deaths under mercury and iron treatment. In all, the author had on short notice compiled a table of more than 7000 cases treated without antitoxin, with a mortality of 8.8 per cent. This appears to show treatment better than antitoxin. It actually shows that when men are following their cases closely and treating early and often, they report good results.

The statistics in the paper of Dr. Welch, contain all the valuable statistics for antitoxin to July, 1895, but here the testimony is only by antitoxin advocates. Yet by reference to the original articles it is seen that many eliminate moribund cases, and include all suspected ones.

Fischer's report is 225 cases mortality 15.5 per cent., *versus* "about 55" previously. Accuracy *versus* a guess, and at the same time he states "I have reduced my mortality somewhat by not injecting hopeless cases."

Bigg's report is 225 tenement cases, mortality 15.69 *versus* 25 to 45 per cent. without antitoxin. The published records of tenement cases, according to the author, are but 10.55 without antitoxin.

The reports from Boston City Hospital, on analysis, show that one-third of the cases were eliminated during six weeks noted, and that 30 per cent. of these died.

The table concerning operations is remarkable. Kraske is credited with 16 tracheotomies with antitoxin; mortality 31 per cent.; 12 tracheotomies with no antitoxin, previously 25 per cent. mortality. His results were 6 per cent. more favorable without than with antitoxin. Yet we are told that "his cases were so few as to have no significance." If so, fifteen reports in the table should be set out, as they are based upon the same or a smaller number of cases.

The mention of nephritis and broncho-pneumonia is striking in some reports. At the Foundling Asylum, 79 per cent. had broncho-pneumonia with the antitoxin, whereas, 40 per cent. had pneumonia in 1894 without antitoxin. In the Willard Parker Hospital, 53 per cent. of antitoxin cases had pneumonia *versus* 16 per cent. in 1894 without antitoxin.

The *British Medical Journal* reports fifty cases in 1894 with 1.6 per cent. broncho-pneumonia *versus* 3.6 with antitoxin in 1895. It is fair to state, however, that in the Willard Parker Hospital the ratio of stenosis and septic cases fell as much as the pneumonia advanced.

Referring to his own cases again, the author said that the inspectors had reported 14 of the 64 cases as not having Klebs-Loeffler bacilli. However, two of these were fetid cases, two had extensive exudate and nose-bleed, another had exudate on the palate and uvula, as well as tonsils. In two, the germs were found when re-examination was asked. One woman complained of much irritation in her throat while tending her four children, all sick with diphtheria, one of whom died. Though no membrane appeared, a culture was made with negative results. Two died without culture reports, yet the bureau of records did not discredit the diagnosis.

As a method to convince himself of antitoxin virtues, the author stated that he had used the remedy in all his hospital cases, and intended to use it also in all dispensary cases for a year, that full years might be compared. Thus far, his mortality in the tenements with antitoxin had been 12½ per cent. In the infant hospital 53 per cent.

If the mortality of 7.8 for 1895, can be cut in two, as claimed, and only 3.5 prevail for 1896, the author will be an advocate of antitoxin. This review of personal experience and from reports of both sides up to the present, lead to the following conclusions:

That diphtheria is very variable in extent, both epidemically and clinically.

That the distinction, true or false diphtheria, requires as much care bacteriologically as clinically. One culture is not enough.

That the present unusual number of cases reported is due to recording bacterial cases without symptoms.

That the falling *ratio* of deaths is due to the same causes. The total deaths do not fall as the ratio does.

That cleanliness and ventilation will immunize as well as serum.

STATISTICS OF DIPHTHERIA.¹

By C. G. COAKLEY, M.D.,
OF NEW YORK.

THE study of the statistics of diphtheria were divided into two periods, an early period prior to the year 1894 and a late period since the beginning of that year. The diagnosis of diphtheria in the early period was shown to be uncertain, as it depended upon certain constitutional symptoms which varied considerably, and upon the presence of a pseudo-membrane. From various motives, physicians during that time failed to report their mild cases, so that the mortality rate was made to seem higher than it really was.

The late period (ushered in by the establishment in cities of means for affording the general practitioner opportunities of having bacteriological examinations of cultures taken from patients' throats and the general interest in diphtheria due

STATISTICS OF DIPHTHERIA.

BOSTON.					NEW YORK.					BROOKLYN.				
Year.	Cases Reported.	Deaths.	Per Cent. Deaths.	Number dying per 10,000 Inhabitants.	Year.	Cases Reported.	Deaths.	Per Cent. Deaths.	Number dying per 10,000 Inhabitants.	Year.	Cases Reported.	Deaths.	Per Cent. Deaths.	Number dying per 10,000 Inhabitants.
1880	1715	588	34.2	16.19	1880	3307	1390	42.03	11.58	1880	3058	1104	36.16	
1881	1680	601	35.7	16.33	1881	5196	2249	43.26	18.13	1881	3218	1169	36.32	19.84
1882	1386	458	33.04	12.24	1882	3507	1525	43.48	11.91	1882	1873	631	33.68	10.34
1883	1415	444	31.4	11.71	1883	2096	1009	48.13	7.72	1883	1185	409	34.51	6.45
1884	1212	345	28.46	8.96	1884	2223	1090	49.00	8.01	1884	976	385	39.44	5.85
1885	1263	334	26.44	8.57	1885	2920	1325	45.37	9.46	1885	1348	519	38.50	7.56
1886	1188	329	27.69	8.20	1886	3737	1727	46.21	11.99	1886	1502	782	52.06	10.46
1887	1049	316	30.12	7.89	1887	5923	2167	36.58	14.54	1887	1995	950	47.62	12.21
1888	1411	470	33.30	11.08	1888	6491	1914	29.48	12.50	1888	2297	984	42.84	12.16
1889	1814	564	31.09	12.93	1889	6443	1686	26.16	10.67	1889	2798	1101	39.35	13.07
1890	1475	401	27.18	8.95	1890	4350	1262	29.21	7.74	1890	2241	902	40.25	10.30
1891	831	232	27.91	5.06	1891	4874	1361	27.92	8.10	1891	1850	766	40.86	8.41
1892	1353	414	30.59	8.86	1892	4654	1436	30.85	7.85	1892	1829	775	42.37	8.35
1893	1465	476	32.49	9.97	1893	*6468	1970	30.45	10.42	1893	1672	607	35.70	6.19
1894	3019	817	27.06	16.67	1894	9155	2359	25.76	12.09	1894	*3812	1279	33.55	12.24
1895	4059	588	14.48	11.73	1895	9925	1634	16.46	8.73	1895	4277	1139	26.63	10.35

That selected cases under faithful treatment of any reasonable kind lead to success.

As Simon well says the efficiency of the remedy not only, but fidelity in its use, gives results. The present antitoxin enthusiasm is born of bacteriology and elimination.

PROFESSOR BRUNS of Tübingen, has been elected president of the German Surgical Congress for next year.

to the introduction of the antitoxin treatment) found a more exact method of diagnosis, and many cases that in the earlier period were not

¹ Read before the N. Y. Academy of Medicine, May 21, 1896. Abstract made by the author especially for the MEDICAL NEWS.

² Bacteriological examination of cultures from throats, established in Boston, November, 1894.

³ Bacteriological examination of cultures from throats, established in New York, May, 1893.

⁴ Bacteriological examination of cultures from throats, established in Brooklyn, February, 1894.

considered to be diphtheria were found to be such. The accompanying table is taken from the official health reports of these cities:

The column "Number Dying per 10,000 Inhabitants" is more reliable than the column "Per Cent. Deaths" as a means of indicating the fatality of diphtheria, for "Per Cent. Deaths" depends greatly upon the "Cases Reported." The failure to report mild cases ending in recovery in the early period and the finding of others (mostly mild cases also ending in recovery) in the late period markedly effect "Per Cent. Deaths" without perceptibly affecting "Number Dying per 10,000 Inhabitants." Could these errors be eliminated, the figures in these two columns ought, with slight variations, to increase or decrease in the same ratio.

Examination of this table shows in all the cities

1. Great increase in the number of cases in 1894 and 1895.
2. Variations in the number of deaths in different years.
3. Per cent. deaths varying, but very low in 1895.
4. Number dying per 10,000, regular variation in rise and fall.
5. That while per cent. deaths *diminished* in 1894, number dying per 10,000 *increased* greatly.
6. While there is a fall in number dying per 10,000 between 1894 and 1895, yet in all but Boston greater falls have occurred before antitoxin was used.
7. Comparing the four columns for each of the cities for the three years 1893, 1894, and 1895, one fails to see that many lives have been saved, although the "Per Cent. Deaths" has been markedly lowered.
8. Diphtheria in 1894 was severe, as indicated by the deaths and number dying per 10,000. Did that epidemic die a natural death, or was it helped out of existence by antitoxin?

As a result of our study of the statistics of diphtheria, not only in the cities above named, but also in many others here and abroad, we find the conditions so different in the early and late period, as we have divided the disease, that any comparison of the death-rate of the latter period with the death-rate of the former period will be apt to lead one to erroneous conclusions.

M. GUINKOFF, at a recent session of the French Academy of Sciences asserted that he had been successful in photographing his own retina. He is now perfecting his method, which must be regarded as an important addition to our present means of accurately recording clinical observations.

CLINICAL MEMORANDUM.

MIND AND WORD DEAFNESS AFTER DE-PRESSED FRACTURE OF THE SKULL WITH SUBCORTICAL HEMORRHAGE—OPERATION; COMPLETE RECOVERY.

By J. T. ESKRIDGE, M.D.,

OF DENVER, COL.:

NEUROLOGIST TO THE ARAPAHOE COUNTY AND ST. LUKE'S HOSPITALS.

FRANK P., twenty-three years of age, single, born in Bohemia, miner by occupation, was admitted into the surgical wards of the Arapahoe County Hospital on the evening of September 21, 1895. The family history, so far as ascertained, was good. The patient lived in his native land until he was thirteen years of age, when he came to the United States. During his youth he acquired a good knowledge of the Bohemian language for a man in the lower walks of life, and after coming to this country he attended school and spoke the English language almost as fluently as his native tongue. For a number of years he has worked in the coal mines of Colorado. He has been addicted to the excessive use of alcohol and occasional venereal excess; but he denies syphilis. He stated that he was never ill until the beginning of his present trouble.

On the 21st of September, 1895, in a drunken brawl, he was struck on the head just above the left ear with the butt of a revolver, or with a coupling-pin, and felled to the ground. On admission into the Hospital a few hours later he seemed dazed and confused, answered questions in English quite intelligently, but slowly. His temperature was 99.4° F. in the left axilla; 99.2° F. in the right; pulse, 80; respiration, 16. The next morning he was able to give some of the details of the injury, but by the afternoon of the 22d he ceased to be able to speak in English, and while he used words and phrases in the Bohemian dialect, they did not convey any meaning when translated into English.

At 8.30 P.M., I was asked by Dr. Rogers, who was attending to the surgical cases of the Hospital during Dr. Parkhill's absence, to see the patient in consultation with him. His temperature remained about the same as it was at the time of his admission, the pulse had fallen to 66, and respiration was 18, but regular. There was no paresis or paralysis of any muscles, the superficial reflexes were absent and the deep reflexes were decidedly lessened. The eye-grounds were normal. The patient watched me during the examination, and seemed to realize in a confused way what was going on. When I spoke to him he appeared to hear, but would answer in Bohemian, and sometimes in English, using words entirely irrelevant, and when shown things, such as a watch or keys, he gave no evidence of recognizing them; nor did he seem to understand anything that was said to him. When told, either in English or Bohemian, to put out his tongue, he made no effort to comply with the request. The mental confusion was so great that it was impossible to determine how much of his condition was due to the

localized injury in the left temporo-sphenoidal lobe, and how much to general brain disturbance.

After a careful examination I came to the conclusion that the patient could hear, but that sounds were unintelligible to him, and he did not seem to realize the use of things. There was such evidence of cerebral compression that Dr. Rogers decided to operate at once. On enlarging the wound, a depression of the skull above the left ear was found. The depressed bone was rectangular in shape, with the long axis extending from before backward and measuring in length $2\frac{1}{4}$ and in width $1\frac{1}{4}$ inches. The center of the depression was on the auriculo-bregmatic line. The lowest portion of the fracture was a half inch above the base line of the skull. The fractured portion was entirely detached from the surrounding bone and depressed from one-fourth to three-eighths of an inch below it. On removing the depressed bone, the membranes seemed normal, and very little extravasated blood was found. As the brain pulsated about normally, it did not seem necessary to open the dura. The base of the skull could be examined readily by the finger, and the opening in the bone appeared to be about opposite the middle third of the second and third temporal convolutions.

The patient reacted well from the operation and on the next morning desired to sit up in bed, so that restraint was required to keep him in the recumbent posture. He looked confused, and did not seem to understand questions or the use of things. When he was spoken to, he would utter one or two disconnected words in Bohemian, and not infrequently would say "yes" in English to everything. The temperature, pulse, and respiration remained nearly the same as they had been before the operation. On the evening of the 23d, about twenty-two hours after the operation, his temperature in each axilla was 100° , pulse 60, and respiration 20.

He slept quite well during the following night, and remained in about the same condition, except that the temperature fell to normal, until four days later, September 27th, when, at 2.30 A.M., he had a violent convulsion in which the trunk muscles seemed to be more affected than those of the limbs. The head was retracted and the eyes were rolled upward to their fullest extent. The convulsion lasted two or three minutes. After this the general condition was about the same as before the convulsion. He was still unable to understand any question or to communicate any of his desires to the nurse or physician. The temperature remained about one degree above normal, but the same in each axilla. The respiration and pulse were normal. I tried repeatedly to examine into his aphasic condition, but was foiled on account of his mental confusion.

On October 4th, at 4 P.M., he had a second convulsion, which was preceded by a loud cry, and when the nurse reached his bedside she found him frothing at the mouth, breathing stertorously, and eyes turned upward. The convulsive movements were general and involved all the limbs. At 11.25 P.M. he had another convulsion, similar in almost every respect to the one that occurred during the afternoon.

On October 5th I saw the patient about noon in consultation with Dr. Parkhill, who had returned and was in charge of the surgical ward. Although no distinct form of sensory aphasia could be made out, it was found that he could utter sounds and words quite distinctly, and that he endeavored ineffectually to communicate his thoughts by speech. It was apparent that he heard my voice, but words to him were apparently meaningless. The ticking of a watch held to his ear, the ringing of a bell, or the jingling of coins seemed to convey to him no meaning. The words that he used, both in English and Bohemian, were so jumbled that they conveyed no meaning. He evidently could hear, even when the right ear was closed, as he looked in the direction from which sounds came, but he could not distinguish differences between the sounds of words, or differences between sounds other than words or speech. It was my belief that a lesion existed in the temporo-sphenoidal lobe, and on my recommending an exploratory incision into this portion of the brain, Dr. Parkhill decided to operate.

On exposing the dura the whole external surface of this membrane over the surface laid bare by the fracture was covered by a layer of organized lymph, at least one-sixteenth inch thick. The lymph was carefully scraped off, but still no pulsation of brain tissue could be felt or seen. The dura was incised and the cortical substance appeared healthy except that it did not pulsate. On cutting into the temporo-sphenoidal lobe at about the center of the wound, dark, partially clotted blood ran out, and on enlarging the opening with a pair of forceps, considerable dark fluid and clotted blood escaped, together with some softened and broken-down brain tissue. The hemorrhage was entirely subcortical and involved the white substance immediately beneath the posterior portion of the first and second temporal convolutions. The wound in the brain was irrigated with sterilized salt solution and the opening in the dura and scalp were closed, except a small space which was left for drainage.

The patient remained in about the same condition for twenty-four hours after the operation that he had been in previous to it, except the right lower side of face was paretic. On the afternoon of the next day, or October 6th, the nurse asked him to turn over in bed and at the same time made a motion in which direction she wanted him to turn. He obeyed her request. In the evening when shown a watch he said "One-half past." The watch at the time indicated 6.30 P.M. He could not be gotten to tell the hour. October 7th, 11.30 A.M., I found that he could read aloud, but could not pronounce long words, nor did he seem to understand what he read. The right side of the face was slightly paretic. It was impossible to get him to protrude the tongue, as he did not seem to understand what was wanted of him, even when I wrote the request and then protruded my own tongue. He seemed much brighter, and when I showed him my watch, which indicated 12.15, he said, "It's exactly a quarter of an hour." When the minute hand had reached the even hour I again showed him the watch, but he seemed to be unable to tell the time of day. When the watch was first shown him he said "pretty

fine," and when it was placed against his ear he said "going pretty well." When he was given asafetida to smell he said "pretty bad," and on giving him milk to drink he said "good," but he did not seem to understand anything that I said to him. He was evidently word deaf, but not word blind, as he could read slowly quite well, although he did not appear to appreciate what he read.

It was difficult, or almost impossible, to determine whether he recognized objects presented to him by the various senses, as he did not seem to be able to read understandingly. Besides, the local injury to the temporosphenoidal lobe, he was suffering from the general effects of traumatism of the head. He could not be induced to name any object, but he appeared to know the use of some objects, as evidenced by his answers when a watch was shown him or placed against his ear (left one). Spoken words had no meaning to him. He read slowly, but distinctly and connectedly, writing and printing, but it was doubtful whether he understood what he read. He made several ineffectual voluntary attempts to write, but could not combine the letters so as to make sense, although he could form the letters well. He could copy single words and read them, but would attempt nothing more, as he seemed to be exhausted. He could not write from dictation, because he could not understand what was said to him. It was observed that he never spoke voluntarily. The right side of the face was still parietic.

On the 8th he was able to recognize letters and call their names, and to write figures and read them. He was able to add two and two, but could not multiply. When shown playing cards he simply called them by the number of spots on them. When shown king, queen, and jack he said one. Cards did not seem to make any mental impression upon him except of number. He was unable to recognize a letter when it was traced with his finger. Re-examination of the eyes showed fundi entirely normal. It was impossible to test the visual fields. The right side of the face was more paralyzed than it was a day or two before, but he now protruded the tongue in the median line.

October 9th remained in about the same condition.

On the 10th he understood what was said to him and repeated a few words. If a thing was held up and a name suggested, he assented to it, giving assent to all names, the wrong name as well as the right one. When asked how he felt he said, "Better." Have you headache? "Yes, a little." Where? He put his hand to the left side of his head. What is your name? "Frank Pezel." He was able to name a watch and tell the time of day. The right side of face is more parietic than it was yesterday, but he is able to protrude the tongue in median line.

On October 11th I made a prolonged and systematic examination to determine the degree and character of the aphasia. This was the first day that his mental condition appeared sufficiently clear to make such an extended examination possible. It was impossible to determine whether he recognized all objects seen. This power existed for the most familiar ones. On testing his power to

recognize objects presented to him by the other senses, varying degrees of apraxia were found present for some. When a watch was placed against his ear he recognized it at once. On covering his eyes and allowing him to feel objects, he became confused. The senses of smell and taste did not seem to convey to his mind as definite impressions as those of hearing and sight. Some things he used correctly and others wrongly in feeding himself.

His power to recall the names of objects presented to him, by the various senses was defective for many things. By the sense of sight he could recall the names of all familiar objects, such as pencil, coins, watch, knife, tobacco, etc., but those less familiar such as book, scissors, needle, spool, pin-cushion, etc., he frequently made blunders in trying to name them. Watch and coins he recalled the names of when he heard them, but bell and keys were sometimes wrongly named. He made many mistakes in naming objects presented to him, by the senses of feeling, tasting, and smelling. Tactile sense seemed to convey to his mind the least definite impression of all the senses. He understood sounds other than speech better than those of speech, and rarely made a mistake in interpreting familiar sounds. His power to understand speech was very imperfect. He showed no apparent intelligent appreciation of speech, except in a few direct questions that related to his own condition, such as "What is your name? Have you headache? Are you hungry?" etc. To every other question or request he would answer "German." He manifested no appreciation of music. It was learned later that he had never known anything of music. He was unable to call to mind objects named, and consequently could not point them out. He invariably recognized his own name when it was spoken, but other names, such as nurse, doctor, etc., he did not recognize unless they were repeated over several times. He did not recognize a word spelled aloud. So far as I was able to determine, he could not call up mentally the sound of a note, figure, letter, or word, but on this point I could not be certain as it was difficult to get him to comprehend what I desired.

He recognized figures and letters, pronounced words shown him, could read printing and writing aloud, but did not seem to understand what he read. He was unable to recall the objects the names of which were seen. When given a pen and requested to write, he wrote his name, but could not be induced to write anything else. He attempted to write every time that he was requested, but after hesitating a while, his name fairly well written was the invariable result of his effort. He could not write at dictation. He wrote from copy, quite well, both printed and written, and converted printing into script.

In testing his ability to write the names of things seen, heard, felt, smelt, and tasted, he wrote the name of only one. This was whisky. He was shown a pencil, and requested to write its name. He shook his head. He was given sugar to taste, cologne to smell, a pencil to feel, and a watch was held against his ear, but he did not attempt to write the names of any of them. When whisky was presented to him by any of his senses, it invariably caused him to smile, and immediately on my requesting

him, he wrote the word "whisky." He read aloud what he had written, but evinced no evidence of understanding what he had written except the word "whisky," and possibly his own name, although it was by no means certain that he understood what it represented. It was learned afterward that he was very fond of whisky. He could not apparently recognize a letter when his index finger was made to trace it. His mental condition was such that I could not determine whether he could mentally call up the appearance of a figure, letter, or word.

There was no defect in voluntary speech except that it was slow. He could repeat words after another, provided they were uttered very slowly. There was a tendency with him to repeat the first word of a sentence two or three times in repeating a sentence after me. The patient recognized some of his mistakes in writing, but seemed unable to correct them. There appeared to be no special difficulty in the use of nouns, verbs, or other parts of speech. He understood and used gesture expression in speech. He could count, both money and in numbers. He was unable to play a game of cards. He did not seem to be able to recognize differences between cards, but when different cards were shown him he called out the number on the card, and all were spades to him. After he recovered he showed quite a fondness for various games with cards. There was no defect in the field of vision. Sensation was perfect throughout the body.

On October 15th he manifested no difficulty in recognizing objects and their uses. He quite readily named most objects presented to him through the different senses. The only trouble apparent in understanding speech was that the first word or words of a sentence appeared to make the most impression on his consciousness, and these would be repeated two or three times. He read printing and writing quite well, but did not show a comprehensive appreciation of what he had written. He could recall the names of most objects presented to him and wrote them. He wrote at dictation imperfectly, as the first word or words of a sentence were repeated several times in writing a sentence. He understood cards and played games with them.

October 22d, no appreciable defect in speech. He said that he did not fully realize where he was and what had happened until a few days ago. He did not remember that he had seen me, and that I had examined him prior to October 15th. He said when he fully regained consciousness that he found he could not speak as formerly in Bohemian. Before his injury he had spoken, as well in Bohemian as in English, but now it was quite difficult for him to think in his mother tongue.

Throughout the period of his illness, beginning September 21st, and ending about October 15th or 20th, his temperature was practically normal, and equal on the two sides of the body, except on the occasions noted in the clinical history just given.

The points of special interest in the above case are, the localizing value of the aphasic symptoms, the external pachymeningitis and convulsions, the mind and word deafness, and the partial loss of the language

which he had first learned, and which he had used exclusively for the first thirteen years of his life.

On September 22d, when I was asked by Dr. Rogers to see the case with him, by the auditory defect of speech alone, before the wound was exposed, the lesion was located in the first and second temporal convolutions. On finding a depressed piece of bone lying against these convolutions, without any extravasation of blood, it was thought probable that there was no deeper lesion. Still the auditory speech disturbance did not improve. A few days later, when the general convulsions began, it was decided by Dr. Parkhill to reopen the wound. On exposing the dura and finding it covered with recent exudate, partially organized, this seemed to be sufficient to give rise to the convulsions, but I argued that the pressure from this was not great enough seriously to interfere with the function of the temporal convolutions. After the dura had been cleansed and incised, no exudate was found on the internal surface of this membrane, and no cause for pressure on the cortical substance of the brain was discovered. It became evident that there must be some subcortical lesion to account for the mind and word deafness. The pulsation of the brain was just apparent, but very feeble. At my request Dr. Parkhill cut into the brain substance and exposed dark, partially clotted blood. After this, when the broken-down brain substance had been removed, improvement became apparent as soon as the effects of the anesthetic had worn off, and two or three days later the mind deafness had greatly lessened, and soon disappeared entirely. The word deafness, on the other hand, remained for at least three weeks longer. Auditory speech disturbances as localizing symptoms will be discussed at greater length in the summary which is to follow the report of this series of cases.

How are we to account for his failure of memory for his mother tongue to a greater extent than for the language that he had acquired after his thirteenth year? In amnesia it is found that memory fails most for things recently acquired, and for those that were learned at more or less remote periods it may be well preserved. In senile dementia the incidents of early childhood and youth may be remembered with great vividness, and prattled about by the dement, yet he may not be able to tell what he has eaten an hour before. In the delirium of fevers, persons, who are foreign born and who may not have had occasion to speak their native tongue for years, will speak exclusively in the language of their childhood. The manner in which memory fails is so invariable that in a case of suspected feigning of amnesia, if recent events are well remembered and the mind is a blank for things learned in early life, we do not hesitate to pronounce the suspect an impostor.

Is this case, then, an exception to the rule? I think not. During the patient's delirious state he talked almost exclusively in the Bohemian language, and only used the English after the receipt of the injury, during the time intervening between this and the development of the delirium, and again as the delirium began to subside, English was substituted for the Bohemian. It

was not until several days after recovery appeared complete that he volunteered the information concerning the difficulty he experienced in thinking in his mother tongue. On inquiry I found that during the five years he had been in Colorado he had not had occasion very frequently to speak the Bohemian language, and from his thirteenth year up to the time he had come to Colorado he had spoken Bohemian only at home, and English with his playmates and school companions.

The facts are these, in his normal condition, he could talk best in that language which he used most, and for a number of years had employed almost exclusively, but in his delirious state the brain-cells reproduced from the memories made upon them when they were most impressionable. The injury to his brain had left him weak, and voluntary recollection was best for those things with which he was most familiar at the time.

While his condition of memory impressed me as being peculiar at the time he volunteered the information concerning it, yet on reflection all mystery disappears.

MEDICAL PROGRESS.

To Preserve Rubber Instruments it has been recommended that they be kept in a three per cent. solution of carbolic acid. Should they not be used frequently, they should from time to time be removed and stretched.—(*Zeitschr. f. Krankenpf.*, April; *Munch. med. Woch.*, 1896, 16).

Osteitis in the Course of Typhoid Fever Disappearing with Defervescence.—At a recent meeting of the Société des Hopitaux WIDAL (*Presse Médicale*, 1896, No. 26, cxxvi) reported a case of typhoid fever in which on the twenty-seventh day of the attack, with the temperature hovering about 102.2°, a swelling half as large as a hen's egg was observed arising from the left ninth rib posteriorly, just below the angle of the scapula. The mass was unyielding to pressure and as hard as bone. The overlying tissues were somewhat reddened. For several days the formation continued to increase in size; then as the temperature declined it grew smaller and smaller, finally disappearing entirely in the first days of convalescence and leaving a slight depression. It was pointed out that the inflammatory lesions of bones associated with typhoid fever appear, as a rule, after convalescence has been established, and not, as in the case reported, in the course of the attack.

The Influence of Injections of Serum upon Articular Rheumatism.—WEISS (*Centralblatt für innere Medizin*, 1896, No. 17, p. 417) reports the results obtained in the treatment of acute articular rheumatism from the employment of blood-serum secured through venesection from individuals convalescent from that disease. Ten cases were thus treated, twenty-two injections in all being given. Following nine injections the articular affection was favorably influenced, as regards both swelling and pain. After six injections no influence upon the morbid process was observed, and following three the condition was aggravated. In seven instances the injection was followed by the

reduction of temperature and sweating. The amount of serum employed varied, on an average, from a dram and a half to two drams and a half.

THERAPEUTIC NOTES.

Treatment of Gastric Ulcer Complicated by Hemorrhage.—

The patient should assume the recumbent posture, with complete rest, not leaving his bed for any purpose, and the stomach should so far as possible be immobilized. Complete abstinence by the mouth should be observed, not even ice being permitted. An ice-bag or cold compress may be applied to the epigastrium with advantage. Should the bleeding persist, a syringeful of the following solution should be injected beneath the skin over the region of the stomach:

R	Dialized extract of ergot	15 grains
	Distilled water	75 minims
	Carbolic acid	1 ½ grain

Nourishment is to be withheld even by the rectum. If the patient is debilitated or the nutritive condition is alarming, recourse may be had to an enema of the following constitution:

R	Milk	8 ounces
	Yolk of egg	number 2
	Sodium chlorid	a teaspoonful
	Red wine	a tablespoonful
	Starch	a tablespoonful

This is to be warmed and injected slowly twice or thrice daily after a lavement of water. To overcome pain codein hydrochlorate or phosphate may be employed in dose of from ⅓ to ¾ grain. If constipation demand intervention enemata of soap-suds, glycerin, olive oil, or castor oil may be employed. The patient remains abed for about a week thereafter, the diet consisting of milk and lime-water or milk with a little tea or coffee, beef tea, bouillon, peptones, meat solution, emulsions of the white or the yolk of egg, carbonated waters; but excluding cocoa, chocolate, and wine. In the second week following the hemorrhage eight ounces of hot Carlsbad water are to be administered night and morning, with from a dram to an ounce of Carlsbad salts. Warm compresses are to be kept applied to the abdomen to the point of inducing redness of the skin.—*Journal de Médecine de Paris*, 1896, No. 14, p. 168.

Treatment of Attacks of Migraine.—1. Diminish the hyperesthesia of the painful area by a spray of some local anesthetic.

2. Immediately afterward practise compression of both temporal arteries, preferably by means of rings of cork held in place by a gauze bandage.

3. At intervals of two hours for four doses a cachet is given containing of

Antipyrin	7 ½ grains
Sparteïn sulphate	½ grain
Caffeïn citrate	1 ½ grain

4. If there is gastric derangement the foregoing combination may be administered by enema.—*Critzmann, Presse Médicale*, 1896, No. 31, p. 185.

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THE PATHOLOGY OF ADDISON'S DISEASE.

WHILE the pathology of the symptom-complex covered by the designation Addison's disease is yet involved in obscurity there is growing reason to believe that the disorder is dependent upon disease of the suprarenal bodies—in some instances of an obvious nature, in others beyond our powers of observation. Further, in a certain proportion of cases changes in the suprarenal bodies are found in the absence of recognized symptoms of Addison's disease. Among the problems therefore awaiting solution at the hands of the pathologist are the extent and nature of the suprarenal disease necessary for the development of symptoms, on the one hand, and the ability of other organs to replace the function of the suprarenal bodies—whatever this may be—on the other.

Occasionally the suprarenal bodies fail to attain their normal degree of development; rarely they are entirely wanting. These conditions are usually associated with other developmental deficiencies, more especially anencephaly and hemicephaly; but as a rule they are not attended with symptoms of Addison's disease.

Hansemann, in *Berliner klinische Wochenschrift*, 1896, No. 296, has reported a case of Addison's disease in which the essential lesion consisted in what was believed to be aplasia of the cortex of the suprarenal bodies. The patient was a man, thirty years old, who presented profound weakness, in addition to impaired nutrition and slight jaundice. He had conspicuously dark hair and almost black irides, so that the swarthiness of his complexion was not especially noticeable. The scrotum and the mammillary areolæ, however, presented distinct pigmentation; so also did some old scratch-marks and the remains of former acne-pustules. The palate too presented a line and a spot of discoloration. The patient grew weaker and weaker and in a short time succumbed. Upon *post-mortem* examination the heart was found to be in a state of brown atrophy. At the apex of the left lung was a small slate-colored cicatrix, together with several small cheesy areas. In the intestines the follicles were swollen and the mucosa swollen and reddened in spots, with a number of hemorrhages. The suprarenal bodies were adherent to the surrounding structures. In their superficial extent they were of about normal size; the right was perhaps undersized. Conspicuous, however, was the reduction in thickness. On section no trace of cortex could be found. The whole gland was represented by reticular structure, containing large cells with pigment. In places a slight degree of small-cell infiltration was visible. Nowhere was there any considerable new formation of fibrous tissue and no noteworthy alterations were detected in the nervous system.

THE EVOLUTION OF BELLEVUE HOSPITAL.

BELLEVUE HOSPITAL, as the great charity hospital of this city, has had a very unique history. In reviewing its development from an almshouse to one of the most reputable public institutions, it is held by good authority that this hospital illustrates the method of properly governing these charities, of which there is a large number in this country. As a rule, they are under the exclusive control of the almshouse authorities of the counties, and hence are subjected to the pernicious influences of the lowest grade of partisan politics. The question which is agitating the

profession in many localities is as to the proper measures to be adopted to rescue these charities from their present degraded condition and place them on a secure basis for future proper development.

A brief notice of the progress of Bellevue Hospital, which has passed through every stage of evolution, from the most disreputable poor-house to a hospital of the first rank as regards its general government and the character of its medical service, may prove useful.

This hospital was opened in 1816, eighty years ago, as the great Charity Hospital of the city. For ten years it was part of the almshouse proper, and under the same management. During this period the hospital became so notorious for its vices and abuses that its very name was a "terror" among the poor. From 1826 to 1847, a resident physician was the nominal head of the hospital, but as he was simply the agent of the governing board, few reforms were effected. In 1847, the medical profession undertook the task of reorganizing the medical service, and succeeded in having a medical board, composed of competent physicians, appointed, with enlarged powers over the management. This was the beginning of real improvements in the hospital. The resident physician was removed, competitive examination of the resident staff was instituted. The introduction of competent medical men into the management of the hospital was of immediate benefit, for it led to the proper care of patients on the part of the resident staff, more exactness in the administration of remedies, strict attention to the sanitary condition of the entire building and grounds, and a careful oversight of all the details of nursing, feeding, and general discipline. The entire *morale* of the institution was changed, and in every part improvements were noticed. The advance of the hospital from that date to the present, though gradual, has been continuous and uninterrupted.

In the period 1850-1860, clinical instruction was given by the visiting staff, and students were attracted in such increasing numbers that in the decade 1860-1870 the hospital became the great center of clinical teaching of the medical schools. It brought into the visiting staff a still higher order of medical men, and into the resident staff

a better class of recent graduates. It concentrated upon the individual patient far more thought and study, both in the discovery of the nature of the disease and in exactness in the employment of remedies. Finally, it introduced into all branches of the service that degree of system and discipline so essential to successful hospital management. In 1872 a training school was established, which revolutionized the ward management and perfected this branch of the service.

The last stage of progress in the evolution of the hospital was the more intimate relation of the medical schools to the management. The service was divided so that each of the colleges had exclusive control of a division, and one division was assigned to members of the staff unconnected with the schools. With this change, the highest order of medical service was secured. The visiting medical staff was composed of the most advanced teachers in their several branches, while the positions in the resident staff became the prizes in the schools most sought after by the students. Thus organized and managed, Bellevue Hospital, according to the report of the Committee on Hospitals of the State Board of Charities, is regarded as a model of excellence.

It will be possible for but few of the charity hospitals of the country to adopt the full scheme of government above outlined, but they can generally be placed under medical boards composed of competent practitioners of the locality. The first step in reform consists in the removal of the medical service of the hospital from the control of the local poor authority to that of the profession. The next step will be the introduction of the trained nurse, which will at once relieve the ward of its hereditary almshouse abuses and scandals. But where the hospital can be utilized for teaching, the crowning act of reform will be the subordination of the hospital management to the elevating and disciplinary influences of the medical school.

A CRITICAL RESUME OF RECENT PROGRESS IN DERMATOLOGY.

PEMPHIGUS.

A GREAT deal of attention has been given of late to the subject of pemphigus, which has always been a fruitful source of discussion. In

time past every bullous eruption was called a pemphigus, qualified by some adjective. At one time authorities described nearly one hundred different forms of this disease. A bulla is one of the primary lesions of the skin and may form under many conditions and in a number of diseases. Happily the present tendency is to the simplification, as far as may be, of dermatological disease classifications, and it is probable that, in course of time, the number of forms of pemphigus will be greatly reduced, much to the benefit of the student of dermatology. In the fifth meeting of the Deutsche Dermatologische Gesellschaft, pemphigus was one of the subjects for discussion. Kaposi, who is always conservative, upheld the view that pemphigus was a definite disease, essentially malignant, and chronic, with a death rate of probably over forty per cent. Its victims, he said, died of amyloid degeneration of the organs, parenchymatous alterations of the heart muscle, diarrhea, and pneumonia. One form of pemphigus may change into another form, showing that all forms are but parts of one disease. He saw no reason for the establishment of such diseases as dermatitis herpetiformis, and pemphigus vegetans. He had never seen a case that he was willing to recognize as dermatitis herpetiformis, as separate from pemphigus, and would regard that disease as described by Duhring as including a number of well-recognized diseases, such as urticaria papulo-bullosa, annularis, gyrata; lichen urticatus, and the bullous form of erythema multiforme.

Rosenthal, who followed Kaposi in the discussion, excluded from pemphigus a number of cases that had been included under it, such as all accidentally bullous affections, as urticaria; all bullous dermatitides; the bullous forms of syphilis and leprosy; pemphigus hystericus; erythema bullosa; hydroa vacciniforme and varioliforme; epidermolysis bullosa; dermatitis herpetiformis; herpes gestationis and impetigo herpetiformis. He believed in the identity of dermatitis herpetiformis. He regarded pemphigus foliaceus and pemphigus vegetans as forms of pemphigus vulgaris, and pemphigus acutus as an infectious disease ending fatally in most cases. Pemphigus vulgaris, he held, was a subacute or chronic disease, exceedingly rebellious to treatment, presenting single-chambered

bullæ, whose seat is below the corneous layer of the skin. Its prognosis was favorable, if of the subacute variety, bad if of the chronic variety.

Schwimmer recognized the identity of dermatitis herpetiformis. Neumann, on the other hand, did not recognize it, but upheld that pemphigus vegetans was a disease sui generis, which was natural, as he was the father of the name.

At the same meeting Eppinger of Grätz, read a paper on the pathological anatomy of pemphigus, in which he stated that his investigations led him to believe that the disease was due to the development of toxins, which first affected the peripheral part of the cutaneous nerves, and later the central nervous system. Through alterations in the terminal ends of the nerves alterations in the skin took place. At first there were changes in the blood-vessels with serous exudation or even hemorrhages.

The whole discussion was a most interesting one, and cannot fail of being helpful. In the present unsettled state of our knowledge it seems to me best to regard as pemphigus only those cases marked by the appearance of bullæ with little or no erythematous halo, that run a subacute or chronic course, and tend to deteriorate the general condition of the patient. Experience of dermatologists in this country certainly upholds our distinguished countryman in establishing dermatitis herpetiformis as a separate disease.

Many of the cases reported as acute pemphigus are certainly only instances of what we here recognize as the bullous form of impetigo contagiosa. Pernet and Bulloch (*Brit. Journ. Dermat.*, 1896, viii, p. 157), report a case of acute pemphigus that certainly is not contagious impetigo. It occurred in a butcher, and apparently originated at the site of a scar, and was probably due to a specific micro-organism. Fifteen weeks after the injury a bulla formed at its site, and nine days later a general eruption of bullæ occurred. Within seventeen days the man was dead. The authors have collected seven other cases of a general bullous eruption following, or presumably following injuries, all being butchers, in six of which death soon occurred. The period elapsing between the time of the injury and the appearance of the bullæ varied from five weeks to three months.

By the French school skin diseases have always been regarded as local manifestations of general disease conditions, while German dermatologists, notably those of the Vienna school, have taught for years the purely local origin of most dermatoses. Within the past three months two papers have appeared, one in France and one in this country, treating of dermatoses occurring in connection with general diseases. Frèche, of Bordeaux (*Journ. mal. cutan.*, 1896, viii, p. 4), discusses the *eruptions of hysteria*. These he finds to be dermatographism, erythema, ecchymoses, and bloody sweats, chronic urticaria, and eczema. All these diseases, of course, occur also in non-hysterical subjects, and have no special marks to distinguish them when in hysterical ones. He believes that pemphigus and gangrene are more frequent in hysterical than in non-hysterical subjects, the latter indeed being seen in them especially. The description he gives of the former would lead me to think that his cases were of the disease we call dermatitis herpetiformis, because of the periodicity of its outbreaks, its patchy character, and the itching, smarting, and burning that attends it. All these symptoms are characteristic of Dühring's disease. His gangrene, he says, has been described by Kaposi as *zoster gangrenosus*, and by Renault as *urticaria gangreneuse*. In it a red, white, or anemic lesion, slightly raised above the surrounding skin appears at some part of the surface of the body, and shortly after another patch will develop at a distant part. The lesion turns blue, then black, breaks down and forms an eschar with a more or less suppurating line of demarcation. After the fall of the eschar a granulating ulcer is left that sometimes heals readily, sometimes only after a long time, and leaves a keloidal scar. The initial lesion may be a bulla, which becomes umbilicated, black, and gangrenous. The disease is always attended with pain, burning, or smarting, which disappear when the lesion forms.

The other paper is by Morrow of New York, and is a very complete study of diabetic eruptions. (*Med. Rec.*, 1896, xlix, p. 508). He divides his paper into two parts. The first treats of those diseases that are symptomatic of diabetes, namely: certain functional diseases of the skin as anidrosis, asteatosis, hyperidrosis, puritus, erythema, ecze-

ma, balano-posthitis, phimosis, furuncles, carbuncles, gangrene, and xanthoma diabeticorum. The second part of his paper deals with those diseases that occur incidentally and with comparative frequency in diabetes, and show a tendency to become better and worse with the fluctuations of the sugar in the urine. These are acne cachecticorum, chronic papular urticaria, impetiginous and lichenoid eruptions, psoriasis, dermatitis herpetiformis, mal perforant, erysipelas, and dermatitis diabetica papillomatosa. It will be observed that in both of these groups of dermatoses occurring in general diseases we have a bullous eruption, which the Frenchman calls pemphigus, but which the American recognizes as dermatitis herpetiformis. This is of special interest, taken in connection with the discussion noticed before. It is by such studies we may at last succeed in answering the question, What do we understand by pemphigus?

GEORGE THOMAS JACKSON, M.D.

ECHOES AND NEWS.

THE next annual meeting of the Medical Society of New Jersey will be held in the Hotel Brunswick, Asbury Park, Tuesday and Wednesday, June 23 and 24, 1896, commencing at 11 o'clock A.M. on Tuesday.

AT the annual meeting of the Washington State Medical Society, held in Tacoma, May 19th and 20th, Dr. R. L. Thomson of Spokane, was elected president, and Dr. J. M. Semple, of Medical Lake, secretary. The next meeting will be held in Spokane, May, 1897.

THE silver lancet case and lancets, formerly used by Jenner and bearing his name, have been presented to the Royal College of Surgeons, to be placed among the other Jenner relics in the college museum.

THE next meeting of British Medical Association will convene at Carlisle on July 28th and continue four days. The address in Medicine is to be delivered by Sir Dyce Duckworth, M.D., LL.D., and that in surgery by Roderick Maclaren, M.D.

AT the special request of Coroner Hoeber of New York City, the police are instructed to leave untouched the effects and surroundings of any person dead from suicide, homicide, or suspected poisoning, until the coroner or his representative shall have seen the body. There already exists a law to this effect but it has been commonly disregarded.

A DISPATCH from London is authority for the statement that the Sultan is suffering from a tumor of the spine. He has refused operation for its removal because

his surgeons are unable to assure him that the procedure is not dangerous.

DR. HENLE, Professor of Anatomy at the University of Tübingen died on May 23d. He was one of the best known of modern anatomists and recognized as one of the best authorities upon the subject. He was, in the early part of his career, assistant to the physiologist Donder's in Holland, and was afterward elected professor in the Universities of Marburg, Rostock, Prague, and Tübingen respectively.

THE TWELFTH INTERNATIONAL MEDICAL CONGRESS is to have a special section devoted to the discussion of the alcohol question. This makes sixteen sections into which the Congress at Moscow is to be divided. It may be of interest to mention in this connection that a new method of treating alcoholism is being subjected to an extensive test in Bellevue Hospital, New York, at the present time. The plan is the result of the study of the subject by a member of the New York Academy of Medicine. It has been explained to the hospital authorities who are convinced of its harmlessness and possible value and have set aside one of the hospital wards for the purpose of giving it a thorough test. The method is not to be made public until it has proved itself efficacious.

AN idea prevalent among obstetricians that from the frequency of the fetal heart-beats the sex of the child can be foretold is now refuted. This oft-quoted theory seems to have had its origin in about fifty observations made by Frankenhauser, who stated that in male infants *in utero* the average rate was 124 a minute while in females it was 144. An observation including one thousand cases at full term at the Boston Lying-in Hospital has proven the disparity between the heart's action in male and female fetuses to be about $1\frac{1}{2}$ beats. Knowledge obtained by counting the pulse rate is not reliable as data in determining the sex.

PROFESSOR PELLMANN of Bonn University, Germany, has made a special study of hereditary drunkenness. He has taken certain individual cases, a generation or two back, and has traced the careers of children, grandchildren, and great-grandchildren in all parts of the present German empire until he has been able to present tabulated biographies of the hundreds descended from some original drunkard. The last person whom Professor Pellmann has immortalized thus in medical literature is Frau Ada Jurke. She was born in 1740, and she was a drunkard, a thief, and a tramp for the last forty years of her life, which ended in 1800. Her descendants have numbered 834, of whom 709 have been traced in local records from youth to death by Professor Pellmann. Of the 709, he found 106 were born out of wedlock. There were 142 beggars, and 64 more who lived from charity. Of the women, 181 led disreputable lives. There were in this family 76 convicts, 7 of whom were sentenced for murder. In seventy-five years this one family rolled up a big bill of costs in almshouses, trial courts, prisons, and correctional institutions. Professor Pellman says this bill,

which the authorities of Germany and therefore the taxpayers have paid, has been at least 5,000,000 marks, or about \$1,250,000.

THE cheap restaurant started by the Clark Thread Company of Newark, for the benefit of its employees has been abandoned because the employees failed to patronize it. The restaurant was started last fall, and was run at a loss for seven or eight months. During the winter the patronage was encouraging, but when warm weather came the trade diminished. The object of the restaurant was to encourage the operatives, and the girls especially, to eat sustaining and wholesome food prepared in a scientific manner, but the young women resented the absence of crullers, doughnuts, and pie, and sneered at the nourishing stews, soups, etc. The prices were very low and the quality of the food was of the best, while there was considerable variety. The absence of pie and cake doomed the enterprise, however. Some practical instruction in physiology in our public schools might avail to correct such mistakes.

THE last calamity to befall Gloucester, England, is a raid upon it by the quacks. The *British Medical Journal* has the following note regarding the latest conditions at that place: "The isolation hospital continues quite full with 296 patients, in addition to whom a large number have still to be treated at their own homes. As is usual in such cases, the city has been visited by all sorts of 'professors' of the healing art, each of whom declares his own particular nostrum to be infallible, not only in curing but in preventing an attack of smallpox. Under the patronizing influence of the local daily paper which has for so many years done its best to discredit vaccination, the advocates of these panaceas have been allowed free scope for making their claims known to the public in its news and correspondence columns. It need, therefore, be no subject for surprise that the hopes thus unscrupulously held out have been grasped at by the unfortunate victims of the disease and their friends, and that the noble army of 'quacks' is doing a brisk trade just now in the city within the precincts of whose cathedral the statue of Jenner looks down on this turmoil of noisy pretenders with the calm confidence of true science."

CHIEF SURGEON DR. J. F. VALENTINE, of the Long Island Railroad, is engaged in organizing a hospital department for the employees of that corporation on the plan of co-operative support, that is so well advanced among certain of the large Western lines. The Atchison, Topeka and Santa Fé Company furnishes hospitals at various towns along the line of the road. The expenses of maintenance are secured by assessments of from 25 to 50 cents a month on each employee, the amount depending on the salary received. The payment of this assessment insures the best of treatment in case of accident or sickness. The Plant System, at the South, has adopted an additional feature, namely, the hospital-car, developed under the direction of Dr. F. H. Caldwell, chief surgeon of the Plant System. These hospital-cars are scattered along the road at division points. In case

of an accident one of these cars is dispatched to the scene at once, and the wounded are cared for properly and immediately. An operating room in the car is fitted with a glass-topped table and all the appliances for performing aseptic operations. There is a consultation room and a larger apartment, fitted with cots and hammocks, in which the injured may be conveyed safely and comfortably to the railway hospitals. It is proposed to have these hospital-cars so located that one can be sent to any point on the road within two hours. A supply of stretchers is aboard each of the hospital-cars, on which the wounded may be removed from the wreck. Each car will have accommodations for more than a dozen patients. The intention of Dr. Caldwell is to use the hospital-cars chiefly to transport the wounded to hospitals. The operating room will be used only when the indications are in favor of immediate operation.

THE following is offered by the *Journal of the American Medical Association* as evidence of "a recruit for Achilles Rose." A new style of prescription writing is recommended by Dr. Loeffler in the *Aerst. Korrespondenzblatt*. The author calls attention to the fact that in prescribing the newer remedies, the names of most of which are familiar to the general public, the customary writing of prescriptions in the Latin language does not protect the physician from inconvenient criticisms of laymen, so that it often would seem advisable to adopt a style less intelligible to most persons. To this end Dr. Loeffler has used for sometime the Greek alphabet though still retaining the Latin nomenclature, and in all the apothecary shops of Dresden his prescriptions are readily understood, *e. g.*, he prescribes antipyrin as follows:

Β ἀντιπυρίν 1.0
Δ. Τὰλ. Δωσ. Νο. χ.
Σ. Daily, etc.

WESTERN MEDICAL REVIEW is the name of a new monthly medical journal, edited by George H. Simmons, M.D., and published in Lincoln, Neb. We are in receipt of Nos. 1 and 2. They are fresh and breezy, first-class, clean, and every way up-to-date. We welcome the *Western Review* to the ranks, and predict for it a most successful career, and a future full of usefulness to the profession of Nebraska and the West.

THE diagrams furnished by the Chicago Board of Health with the March, April, and May monthly reports show, in graphic manner, the sanitary quality of the water and the average daily deaths from the diseases affected thereby for a period of twenty-four weeks—from the week ended December 21, 1895, to the week ended May 30, 1896, inclusive. Examination of these diagrams discloses three periods of several successive weeks each, to-wit: first, from December 21 to January 25—six weeks; second, from February 22 to April 2—seven weeks; third, from April 11 to May 30—eight weeks. During these periods the deaths from the acute intestinal diseases—also shown on the diagrams—were 206, 137, and 258, respectively. The water supply was "suspicious" or "bad" during the first and third periods, with an aggregate of 464 deaths, or a daily average for the fourteen weeks of

4.7. The water was "usable" or "good" during the intermediate period of seven weeks with an aggregate of 137 deaths, or a daily average of 2.8. The higher death rate of the first and third periods can be attributed to no other cause than polluted water. Applying to the entire year the figures of the twenty-four weeks covered by the diagrams—which is certainly a sufficiently long period to generalize from—we should have with a good sanitary quality of water, 365 days x 2.8 deaths = 1022 total deaths; with a bad sanitary quality of water, 365 days x 4.7 deaths = 1715 total deaths. Excess of deaths due to polluted water, 693, at \$5000 each = \$3,465,000. This sum represents the interest at five per cent. on a capital of \$70,000,000. How much of this amount would be required to complete the drainage channel, build intercepting sewers, and insure a pure water supply the year round?

It is reported by Dr. Audry, of the Toulouse Faculty, that by the action of radiant heat from a thermo-cautery, which is brought near but not in contact with a soft chancre, the process is converted into a simple ulcer. The usual application of a cautery is of course followed by an eschar that slowly separates, whereas the method of Audry avoids this inconvenience and is quite as effective.

THE death of Sir George Johnson, M.D., F.R.S., Physician Extraordinary to Her Majesty the Queen, occurred on June 3d, after a brief illness.

CORRESPONDENCE.

THE NEW URETHROSCOPE—DR. HAWKINS' REPLY.

To the Editor of THE MEDICAL NEWS:

DEAR SIR: I have always regarded the name of Otis with the most sublime respect, and deeply regret the fact that I am constrained to differ with one bearing that great name, and am liberal enough to acknowledge a mistake when I have made it. In regard to the criticisms of Dr. W. K. Otis of my Urethroscope, if I have been guilty or claiming the results of some other person for myself I regret it and it is unintentional, but I think if Dr. Otis will kindly reread the description of the instrument he will find that it encroaches on no one's previously acquired territory.

I may have been hasty in passing my opinion on Dr. Otis' "Perfect" Urethroscope, as it is possible that that there may be a difference in the instrument as made by me and the one made under his direct supervision. The instrument which I used was made from the description published by Dr. Otis in *The New York Medical Journal* of December 17, 1892. After using this instrument for a while I hit upon the idea of applying the principle of the ophthalmoscope to the urethroscope, with the result described in THE MEDICAL NEWS of May 23d. I was not aware that an instrument of this description had ever been made, and if the original instrument of Dr. Otis, as shown in Culver & Hayden's Manual of Venereal Diseases, is reproduced in my instrument I would cheerfully apologize to the doctor. But I am unable to see the similarity, as I use a mirror with a perfor-

ated center as is used on the ophthalmoscope, while that on the Otis instrument is a solid mirror, as on the Leiter, set low enough for the returning rays from the tube to strike the operator's eye. The doctor has observed a technicality in my wording of the sentence regarding the quantity of light I claimed was thrown down the tube with my instrument. The mirror used on my instrument is about the same size as that on the Leiter, $1\frac{1}{2}$ inch. With my instrument, on actual measurement, a cone of rays whose base, on the face of the mirror, is about a half inch in diameter, is all the light that is actually used, the remainder being spread out upon the face of the plate on the Klotz tube. Now with my instrument the light is gathered from *all around* the central perforation *in the shape of a cone*, whose radius at the base is one-fourth inch. With the Leiter plan, using the mirror set below the path of the rays, the light is gathered from *less than one-half as much mirror surface*. It is then only reasonable that with the same lamp more rays will be thrown down the tube than with the Leiter. I have used in these experiments a Klotz tube, No. 26 F., $4\frac{1}{2}$ inches long. I use a four-volt Edison electric lamp of one candle-power and get a light far superior to that obtained with the Leiter instrument. This last assertion has been verified by other observers with my urethroscope.

I do not deny that a bull's-eye condenser will throw a powerful light; such a statement would be ridiculous, but the trouble I experienced with the instrument made from Dr. Otis' description of his "Perfect" Urethroscope was to intercept the return rays as the condensing apparatus obstructed the path. It is, therefore, necessary to lower the condenser, as with the Leiter instrument, and look over the top of it.

Anyone, not inclined to quibble, can at a glance see the difference between my instrument and that of Desormeaux, which was invented before the days of the practical application of the electric light. The U. S. Patent Office recognizes and issues letters patent on "new combinations of old parts, whether relating to material objects or to processes."

I stated in my paper that a portion of the mirror in the Leiter instrument was removed to complete the axis of vision. My wording might have been clearer, the meaning I wished to convey being that set forth above—the removal of a portion of the mirror below the path of the rays in order to allow the operator to look over the instrument, caused *not* a "little more than one-half of the light thrown in the direction of the mirror" to be wasted, but *all except those rays from the upper part of the mirror*, a little more than a quarter by half an inch in area, as stated above.

That the principle of this instrument is correct is shown by the exclusive use of the principle by the ophthalmologist, and the almost exclusive use of it by the rhinologist, laryngologist, otologist, and many genito-urinary surgeons who do not possess a urethroscope—all using a mirror with the rays of light passing through the central perforation.

JOHN A. HAWKINS, M.D.

105 JACKSON STREET, ALLEGHENY, PA.,
JUNE 9, 1896.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

General Meeting, June 4, 1896.

JOSEPH D. BRYANT, M.D., President.

DIPHTHERIA ANTITOXIN.

THE discussion of this subject was begun at a regular meeting of the Academy, May 21st, by JOSEPH E. WINTERS, M.D., who read a paper upon

CLINICAL OBSERVATIONS UPON THE USE OF ANTITOXIN IN DIPHTHERIA; AND A REPORT OF A PERSONAL INVESTIGATION OF THIS TREATMENT IN THE PRINCIPAL FEVER HOSPITALS OF EUROPE, DURING THE SUMMER OF 1895. (SEE PAGE 685.)

The meeting then adjourned to June 4th. The discussion was continued by P. H. ERNST, M.D., of New York, who read a paper upon

EXPERIENCES WITH THE ANTITOXIN.

He reported seventy-seven cases of diphtheria treated by him, for the most part in dispensary practice, since May, 1895. Of these cases, twelve had been treated with antitoxin, eight of them being considered severe and four mild. Of this series, seven died. Of the sixty-five treated without antitoxin, forty-two were considered to be severe. Eleven of the cases were intubated. The number of deaths in this second series was eleven. Dr. Ernst said that he had at first expected much from the antitoxin, but finding that it did not appear to have the slightest favorable influence, and that convalescence after its use was especially tedious, he abandoned the treatment.

W. L. STOWELL, M.D., presented the next paper, upon

DIPHTHERIA WITH AND WITHOUT ANTITOXIN. (SEE PAGE 694.)

WILLIAM H. THOMSON, M.D., of New York, opened the general discussion by calling attention to the fact that in estimating the value of a method of treatment for any infectious disease, there were certain unavoidable and important sources of error. For instance, the diagnosis was often a matter of uncertainty; the important influence of individual "soil" must be taken into account, and the virulence of the pathogenic microbes themselves varied very greatly at different times. The opponents of antitoxin had assumed, though most illogically, that this complex antitoxin serum must exert a specific effort, comparable to the action of a chemical antidote, and also that the occurrence of failures with this remedy was proof that it was useless. If such an argument were correct, we would be compelled by the same process of reasoning to conclude that mercury is worthless in the treatment of syphilis, and quinin of no value for the cure of malaria. To decide upon the value of this treatment, reports of many thousand cases must be submitted from many different parts of the world, so as to eliminate local sources of error. Such evidence, he thought, was already at hand. Dr. Thomson then read extracts from hospital reports in various parts of the world, regarding the effect of antitoxin in the treatment of diphtheria. Out of eighty-five

such hospital reports, there had been collected the results of the treatment in 9893 cases of diphtheria, viz., 1820 deaths, or a mortality of 18.3 per cent. In addition to this, fifty-three of the hospitals furnished definite comparisons with the death-rate prior to the introduction of diphtheria antitoxin, which was found to have been 44.3 per cent. It was evident, therefore, that the death-rate in the hospitals had been reduced at least fifty per cent. by the antitoxin treatment. The speaker also presented reports from private practice, aggregating 3760 cases of diphtheria treated with antitoxin, with 296 deaths, or a mortality of 7.8 per cent. Adding together the hospital and private cases, one obtained a total of 13,653 cases, with a mortality of 15.5 per cent. This mortality, Dr. Thomson said, showed that diphtheria antitoxin was not a "specific" in the sense in which Dr. Winters used this term, *i.e.*, a remedy which should give a uniform percentage of recovery all over the world, and should be invariably successful. It would not do to report an occasional failure from antitoxin as an argument against the value of the remedy. He believed that antitoxin had been already proved to be a remedy of great efficacy, and he looked upon the introduction of this new method of treatment as one of the great achievements of this century.

GEORGE L. PEABODY, M.D., of New York, said that it was not fair to argue that because a remedy did not reduce the mortality to the same extent everywhere, that therefore the remedy is useless. No remedy of modern times could stand such a test as that. Statistics of any treatment were largely affected by the fidelity and zeal with which that treatment was carried out. For example, Brandt had collected records of 19,000 cases of typhoid fever treated by his cold-bath method, by all classes of physicians, with a mortality of 20 per cent., whereas in 800 cases treated by the same method, but only by those having faith in the treatment, the mortality was 8 per cent.

Referring to the meeting of two weeks ago, he said that we had been told at that time that a number of cases had died shortly after the administration of antitoxin, and the inference had been drawn that it was because of the administration of this remedy; but we had not been given sufficient details regarding these cases to enable us to judge intelligently as to the cause of death. It was true that in some instances the use of the immunizing serum had failed to prevent the development of diphtheria, but in these cases might it not be reasonable to suppose that the disease had been already in the system, but inactive? Much stress had been laid upon the fact that the physicians who had witnessed the use of antitoxin in the hospitals, had refused to submit themselves to this treatment. Such an argument was not a particularly strong one, but to offset this he would say that last winter he had received a large dose of antitoxin, with no ill effect other than the production of a slight urticaria around the site of the puncture. Some of the serious consequences reported after the use of antitoxin, were probably due to impurities in the antitoxin, but this was rather an argument against these impurities than against the antitoxin, and moreover he had been informed that some of these impurities, at least, could be readily detected, so that this possible

source of danger was largely preventable. His experience with the remedy had impressed him with the important part played by individual susceptibility. For example, he had personally injected three patients at the same time, with the same antitoxin, using the same syringe. One of these individuals, an adult, developed a severe urticaria with joint pains, while the other two, an adult and a child, showed no unpleasant effect from the treatment. At the previous meeting he had been led to believe by the speaker of that evening, that it was our duty to listen to and accept all evidence against antitoxin, and close our ears to all reports that were favorable to the remedy.

J. J. KINNION, M.D., of the Marine Hospital Service, sent through Dr. A. A. Smith, a communication, which was read by the secretary. In it, he said, that for the past five years the Marine Hospital Service had been making a collective investigation regarding diphtheria, and had in this way collected records of 131,620 cases of diphtheria and croup, occurring from 1891 to 1894, with 51,820 deaths, or a mortality of 39 per cent. These reports came from 109 cities, and in 1895 the same cities reported 45,690 cases with 11,640 deaths, or a mortality of 25 per cent. The reports indicated that where antitoxin had been used most freely, the death rate had been most markedly reduced. The reports also showed that 2936 cases had been treated without antitoxin, with 1010 deaths, or a mortality of 41 per cent. Of 2400 children who had received the serum for immunizing purposes, only 19 cases of mild diphtheria had developed within a few days, and no ill effects had been noted from the use of the serum.

JOHN W. BRANNAN, M.D., of New York, in discussion presented

A CRITICAL ANALYSIS OF DR. WINTER'S CLINICAL OBSERVATIONS ON THE ANTITOXIN TREATMENT OF DIPHTHERIA. (SEE PAGE 691.)

H. W. BERG, M.D., of New York, said that the probable explanation of the greater frequency of bronchopneumonia as a complication of the cases of diphtheria which had been treated by antitoxin, was that this remedy kept a larger proportion alive for a sufficient length of time to allow of the development of the pneumonia. The much greater frequency of this complication in hospital practice had been noted, and was probably explicable on the theory that it was due to a streptococcus infection. He would explain Dr. Ernst's unfavorable experience with antitoxin, by the fact that his cases had been seen in dispensary practice, and consequently at a late stage of the disease. From the description given by Dr. Ernst, it would seem that these cases had been of a severe type. Dr. Winters had certainly been most industrious in the collection of his facts, but he had unfortunately drawn from them very illogical conclusions. His great argument against antitoxin was that its administration had been followed at times by sudden death. If this were a valid argument, one would expect such a result to be much more common, to say nothing of the fact that sudden deaths were by no means unheard of before the advent of this new treatment. In his opinion, it was incumbent upon the opponents of the antitoxin treatment to prove

that the remarkable results obtained in the laboratory with this remedy cannot be reproduced in the treatment of the human subject. Personally, he had been profoundly impressed with the results of the treatment in his private practice, and he looked upon antitoxin as the most remarkable remedy he had ever used.

A. CAILLÉ, M.D., of New York, said that he had intended to prove that Dr. Winter's communication was devoid of any scientific value, but as that had already been done he desired only to refer to the results of the collective investigation instituted by the American Pediatric Society, and only just now brought to a conclusion. This report has been most carefully prepared, and included 6000 cases from private practice, occurring in all parts of the United States and Canada. In every instance, the diagnosis had been confirmed by a bacteriological examination. The report showed most conclusively the correctness of Behring's claim, that the mortality in diphtheria could be reduced by the use of antitoxin to five per cent. or less. Personally, he had obtained most gratifying results from its use in the treatment of diphtheritic croup. Before using it his death rate in these cases had been about seventy per cent., but recently he had had the pleasure of witnessing the recovery of ten consecutive cases under the antitoxin treatment. History showed that opposition was one of the accompaniments of the evolution of scientific medicine. He would say most emphatically that in his opinion antitoxin had come to stay.

HAROLD C. ERNST, M.D., of Boston, said that experience had emphasized the importance of using a reliable preparation of the antitoxin, and of always taking it from a freshly opened bottle. There had been reported to the Boston Board of Health 1164 cases of diphtheria, which had been treated with antitoxin. Of this number 983 were treated in the Boston City Hospital, with a mortality of 15.6 per cent. For years past the mortality from diphtheria in that hospital had been over 40 per cent. Of the 181 cases from private practice fifteen died, or a mortality of 8.2 per cent. The records showed that the general mortality in Boston for the twenty years past had never been less than 26.5 per cent. until last year, when it dropped to 14.48 per cent. He had also received reports of 346 cases in which the serum had been used for immunizing purposes, and in not a single instance had there been any evidence of paralysis, nephritis, or indeed of any serious consequence. This was good proof of the harmlessness of the antitoxin serum.

GEORGE MCNAUGHTON, M.D., of Brooklyn, said that when he had reported last year the treatment of nineteen cases of laryngeal diphtheria with seventeen recoveries, Dr. Winter's rejoinder had been that that meant nothing. He could now report a total of eighty-nine cases of laryngeal diphtheria treated with the aid of antitoxin, with only thirty deaths. All of these cases had been seen in private consultation practice, from which it was fair to infer that most of them were of a severe type. All but five of the cases had been intubated. On searching his records for purposes of comparison he had found that of the seventy-two cases treated just before the introduction of antitoxin forty-eight had died, whereas of the first seventy-two

cases treated with antitoxin only twenty-four had died. He was convinced that this indicated that antitoxin had a definite value.

WILLIAM H. PARK, M.D., of New York, said that one of the strongest points in the statistical argument in favor of antitoxin was that by the use of this remedy the death-rate from diphtheria had been reduced, not merely in one or two localities, but all over the world. Of the 2000 cases immunized by the New York City Board of Health, only two had shown any complications worthy of note, and in only six had the disease developed between the second and thirtieth day. He had spent much time in observing the same cases in the Willard Parker Hospital, as had Dr. Winters, yet he was forced to agree with Dr. Brannan that the clinical picture of these cases, as portrayed by Dr. Winters, was not that which he had seen. Moreover, Dr. Winters had shown an evident lack of care in collecting his statistics, for he had referred to eight consecutive recoveries from laryngeal diphtheria having taken place in the Hospital in December, whereas the Hospital records showed that, as a matter of fact, all the laryngeal cases in this month had succumbed to the disease.

H. HERALD, M.D., of Newark, said that just prior to January 1, 1895, the time of the adoption by the Newark Board of Health of the system of making bacteriological examinations to establish the diagnosis of diphtheria, the mortality from diphtheria in that city had been about thirty-five per cent. After July 20, 1895, the Board had supplied its own antitoxin, and from that date to May 1, 1896, 1039 cases of diphtheria had been reported, with 243 deaths, or a mortality of 23.1 per cent. Of the 653 cases in which antitoxin was used there were ninety deaths, or 13.5 per cent., while in 386 cases in which it was not used, there were 153 deaths, or a mortality of 39.6 per cent. In the Newark City Hospital, before the antitoxin treatment, the mortality from diphtheria had been forty-two per cent.; since its introduction, 16.4 per cent.

HENRY F. KOESTER, M.D., of New York, said that from February 28, 1895, to January 1, 1896, he had used antitoxin in 200 cases in private practice, with 40 deaths, or a mortality of 20 per cent. Of these 200, 36 were laryngeal, and the mortality in this class was 27.7 per cent. Of the 355 cases in which he had employed the serum for immunizing purposes, 4 had developed the disease within twenty-four hours. He had never seen any serious results from the treatment, and now preferred to give an initial injection of as much as 2000 units.

J. MILTON MABBOTT, M.D., of New York, said that so far as he had been able to learn, there had been no very great diminution in the actual number of deaths from diphtheria, and in the few cases in which he had known it to be used in private practice, the disease was of such a mild type that no reliable inferences as to the curative value of the serum could be drawn. Certainly, many cases which did not present the clinical picture of diphtheria were nevertheless pronounced to be such by the bacteriologists of the Board of Health.

JOSEPH E. WINTERS, M.D., of New York, in closing the discussion, said that Dr. H. C. Ernst, in contrasting the death-rates in Boston for the last two or three years,

had neglected to state that there had been 112 more deaths in Boston in 1895 than in 1894. This same criticism applied to almost all the reports received, and it could not be too strongly emphasized that the percentage death-rate was absolutely worthless unless accompanied by the total number of cases and the total number of deaths. A good example of the wide variations in the type of the disease was to be found in the fact that in one year, in Philadelphia, 350 deaths from diphtheria were reported, whereas, three years later, there were over 1400 deaths. In the Willard Parker Hospital, the mortality in the intubated cases since the introduction of antitoxin was about 68 per cent. In the Municipal Hospital, Philadelphia, the mortality in this class of cases, in 1895, without antitoxin, was 56.3 per cent.

In reply to Dr. Brannan, he would say that, in citing illustrative cases, he had not limited himself to the first few months of 1895 or 1896, but had taken the cases from the entire record, and in presenting them had given the dates of their admission. His first impression of the antitoxin treatment had been obtained from the observation of a case in the Willard Parker Hospital, in the fall of 1894. The patient was a robust young physician, affected with a severe, but uncomplicated diphtheria, yet, in spite of the antitoxin, the case had terminated fatally in two weeks and one day, and apparently without the antitoxin having exerted the slightest favorable influence upon the course of the disease. That same autumn, only five cases had received this treatment at the Hospital. Of this number, four died, and the fifth only recovered after an exceptionally prolonged convalescence.

These facts had impressed him so deeply that he had sought the counsel of the late Dr. A. L. Loomis, and had been advised by him to make public his adverse views regarding antitoxin. He had, however, shrunk from so doing at that time, lest his conclusions might be premature, and he might in this way deprive others of whatever benefit there might be in the new treatment. He had been accused of being prejudiced. That was an awful accusation to make in regard to such a dreadful disease as diphtheria, and those who knew him best were aware that he could not have been brought into the position in which he found himself to-night, had he not been profoundly impressed with the dangerous nature of this so-called remedy. If he could believe that it was harmless, as well as useless, he would never have raised his voice against it. As it was, he felt that in time every member of the Academy would be forced by his own convictions to feel as he did at present on this subject.

ANNOUNCEMENT.

VACANCIES IN THE MEDICAL CORPS OF THE U. S. ARMY.

THERE are at present three vacancies in the medical corps of the United States army, and it is expected that at least three more will occur during the present year. As usual, an Army Medical Board will meet in Washington early in October for the examination of candidates. The

requirements for admission to the medical corps are stated in a circular issued by the surgeon-general of the army, dated May 21, 1896, and approved by the Secretary of War, as follows:

"Permission to appear before the Board is obtained by letter to the Secretary of War, which must be in the handwriting of the applicant, giving the date and place of his birth, and the place and State of which he is a permanent resident, and inclosing certificates, based on personal acquaintance, from at least two reputable persons as to his citizenship, character, and habits. The candidate must be a citizen of the United States, between twenty-two and twenty-nine years old, of sound health and good character, and a graduate of some regular medical college, in evidence of which his diploma will be submitted to the board. The scope of the examination will include the morals, habits, physical and mental qualifications of the candidate, and his general aptitude for service; and the Board will report unfavorably should it have a reasonable doubt of his efficiency in any of these particulars.

"The physical examination comes first in order, and must be thorough. Candidates who fall below sixty-four inches in height will be rejected. Each candidate will also be required to certify 'that he labors under no mental or physical infirmity or disability which can interfere with the efficient discharge of any duty which may be required.' Errors of refraction, when not excessive, and not accompanied by ocular disease, and when correctable by appropriate glasses, are not causes for rejection.

"The mental examinations are conducted by both written and oral questions, upon:

"1. Elementary branches of a common school education, including arithmetic, the history and geography of the United States, physics, ancient and modern history, and general literature. Candidates claiming especial knowledge of the higher mathematics, ancient or modern languages, drawing, analytical chemistry, or branches of natural science, will be examined in those subjects as accomplishments and will receive due credit therefor according to their proficiency.

"2. Professional branches, including anatomy, physiology, chemistry, hygiene, pathology and bacteriology, therapeutics and materia medica, surgery, practice of medicine, obstetrics and the diseases of women and children.

"Examinations will also be conducted at the bedside in clinical medicine and surgery, and operations and demonstrations will be made by the candidates upon the cadaver.

"Hospital training and practical experience in the practice of medicine, surgery, and obstetrics are essential to candidates seeking admission to the medical corps of the army, who will be expected to present evidence that they have had at least one year's hospital experience or the equivalent of this in practice.

"To save unnecessary expense to candidates, those who desire it may have a preliminary physical examination and a mental examination in the 'elementary branches of a common school education,' by a medical officer of the army stationed most conveniently for this purpose, who will act under instructions from the Medical Examining Board."